



Answers:

VARC	DILR	QUANT
1. B	35. B	67. 20
2. B	36. C	68. 15
3. B	37. A	69. 11
4. C	38. B	70. 20
5. D	39. A	71. 70000
6. A	40. A	72. D
7. A	41. A	73. B
8. D	42. A	74. A
9. C	43. A	75. D
10. C	44. 60	76. A
11. B	45. 170	77. B
12. B	46. A	78. D
13. C	47. 1	79. D
14. A	48. 6	80. A
15. B	49. B	81. C

16. C	50. B	82. B
17. D	51. B	83. B
18. A	52. A	84. B
19. C	53. B	85. 6
20. B	54. D	86. 24
21. C	55. C	87. D
22. C	56. D	88. D
23. A	57. C	89. C
24. D	58. C	90. B
25. C	59. C	91. B
26. C	60. C	92. 11
27. C	61. 40	93. 24
28. 54132	62. 4	94. 2
29. 15243	63. 2	95. 160
30. 54123	64. B	96. A
31. 32145	65. 2	97. A
32. 3	66. B	98. A
33. 4		99. A
34. 1		100. B

Explanation:

VARC

1.B

Option A: He gives explanation/reasoning behind the various methods adopted in history but does not question them.

Option C: The author doesn't discuss about the merits/ demerits or evaluate a method of map-making. It is involved more with the history of the method.

Option D speaks about myth. While most of the data are quoted from history, they cannot be misrepresented as a myth.

The author starts the passage by talking about the history of map making. The author then mentions how north was never put at the top in ancient times.

"Given such a long history of human map-making, it is perhaps surprising that it is only within the last few hundred years that north has been consistently considered to be at the top. In fact, for much of human history, north almost never appeared at the top".

He implicitly means that people have a preemptive notion of maps facing the north. He goes on to mention that it was considered a bad direction. He says that north being put at the top is a fairly recent phenomenon. He then goes on to discuss why different people started putting north at the top. He mentions that the reasons for different people putting north at the top were different from what people think now.

He cites various examples to show that north's presence in top is more recent and due to varied factors. Hence, he is trying to clear certain misconceptions about why north is put at the top in the maps. Thus, option B is the most suitable answer.



2.B

The passage mentions that the Chinese put North at the top of the map because the emperor would live in the North and he preferred to look towards South. Hence, the fact that South was preferred by some emperors is not a reason why North was put at the top. Hence, option B is false. All other options are mentioned in the passage.

3.B

We can straightaway eliminate options A and D. The passage states that the Chinese compasses pointed to magnetic south and that south was considered a more desirable direction. While option C is true, that is not the reason why North was placed at the top.

The passage states that the emperor lived in the north and hence maps depicted him as above his subjects.

Thus, north was placed at the top of the map to show respect for the emperor. Thus, option B is correct.

4.C

We can straightaway eliminate option A. The author says that though one might think that the trend of north-up maps was set by these explorers, this is in fact not true. Options B and D are also incorrect. The passage says that the explorers navigated with the help of the North Star.

In the passage, it is given that "When Columbus describes the world it is in accordance with east being at the top, he says. "Columbus says he is going towards paradise, so his mentality is from a medieval mappa mundi."

Hence, we can infer that statement C is true.

5.D

In the passage, the author discusses how North was traditionally not put on the top of early maps. The author explicitly refutes the role of the compass and of European explorers in placing North at the top of maps. Hence, we can eliminate options A and B.

The author says that East was placed at the top of Christian maps. Hence, option C is also incorrect. Though the author counters all known explanations as to why North was placed on the top, he does not offer any explanation of his own. Hence, option D is correct.



6.A

According to the passage, early Egyptian maps placed the East at the top because that was the position of sunrise. Hence, we can say that natural phenomena dictated the map-making convention in this case. Thus, option A is correct.

Options B and D are incorrect as the conventions were decided by religious factors and not natural phenomena.

Option C also can be eliminated as the orientation was a result of their desire to honour their emperor. Hence,

the answer is option A.

7.A

In the first passage, the author mentions printing press as the internet of its day. Immediately, in the next paragraph he elucidates how printing press helped in spreading ideas and information. Thus, the author likened the printing press to the internet because it enabled access to new information and sharing of ideas.

Hence, option A is the correct answer.

8.D

From the lines "Medical information passed more freely and quickly, diminishing the sway of quacks" and "Gutenberg's brainchild broke the monopoly that clerics had on scripture", we can infer that option B is true.

From the lines "And later, stirred by pamphlets from a version of that same press, the American colonies rose up against a king and gave birth to a nation" and "it's hard to imagine the French or American revolutions without those enlightened voices in print", we can infer option A is true.

From the lines "Before the invention of the printing press, it used to take four monks up to a year to produce a single book. With the advance in movable type in 15th-century Europe, one press could crank out 3,000 pages a day", we can infer that option C is true.

Option D has not been stated nor implied anywhere in the passage.

9.C

Refer to the following lines - "Not long after Steve Jobs introduced his iPhone, he said the bound book was probably headed for history's attic". Thus, we can infer that Steve Jobs predicted that reading printed books would become a thing of the past. Hence, option C is the right answer.

10. C

The author says that the iPhone has not fulfilled its potential as a piece of revolutionary technology. He goes on to say that the hope was that the iPhone could help in liberating people in closed societies. However, the failure of the Arab spring and continued suppression in places like North Korea shows that this has not happened.

Hence, the author uses the continued suppression of free speech in closed societies to indicate why he is still uncertain about the potential of the iPhone. Hence, option C is correct.



11.B

Refer to the line "it's hard to imagine the French or American revolutions without those enlightened voices in print". Hence, from this we can straightaway eliminate options A and C. Between options B and D, B correctly captures the point made by the author. The printing press allowed the spread of enlightened voices and as a result people were exposed to new ideas on freedom and democracy.

Option D slightly distorts what is given in the passage. The passage does not mention any revolutionary "strategies". Hence, we can eliminate this option.

Thus, the answer is option B.

12.B

The main point of the passage is that unlike the Gutenberg printing press, the iPhone has in comparison done nothing to make the society more liberated or enlightened. This point has been accurately captured by option B.

The author is not weighing the advantages or disadvantages of new technology. Hence, we can eliminate option

A.

The author does not say that the society has rapidly changed as a result of new technology. In fact, he says that nothing really has changed as a result of it.

The author says that people are no longer daydreaming as a result of new technology. Hence, option D, which contradicts what is given in the passage, can be eliminated.

13.C

The author argues that malls were more than just shopping places. Towards the end of the passage, the author tries to invoke a sense of nostalgia by stating how malls used to play an important role in everyone's life and how that function is getting lost. Let us evaluate the options.

Option B states that the advantages of the malls outweigh the disadvantages. The author has not mentioned anything about the disadvantages of the malls. Therefore, we can easily eliminate option B.

Option D states that malls are closing down since people have found an alternate way to shop. Though the option is true, the main point of the author is not that malls are closing down. The author is concerned about the fact that malls were places of congregation and the closure of malls takes a social function away with them. Therefore, we can eliminate option D as well.

Options A and C are close. Option A states that the closure of malls has affected the social and economic life of America. However, the author states that the closure of malls is reflective of the changing social structure of America. Option A gets the relationship backwards and hence, option A can be eliminated.

Option C states that malls used to perform a social function that has been lost. This seems to be the main point that the author is trying to emphasize through the paragraph. The author states how malls used to be places of congregation and how the new generation finds no need to go to malls. Therefore, option C is the right answer.

14.A

No where has it been mentioned that Amazon is helping brands go online. Therefore, we can eliminate option C.

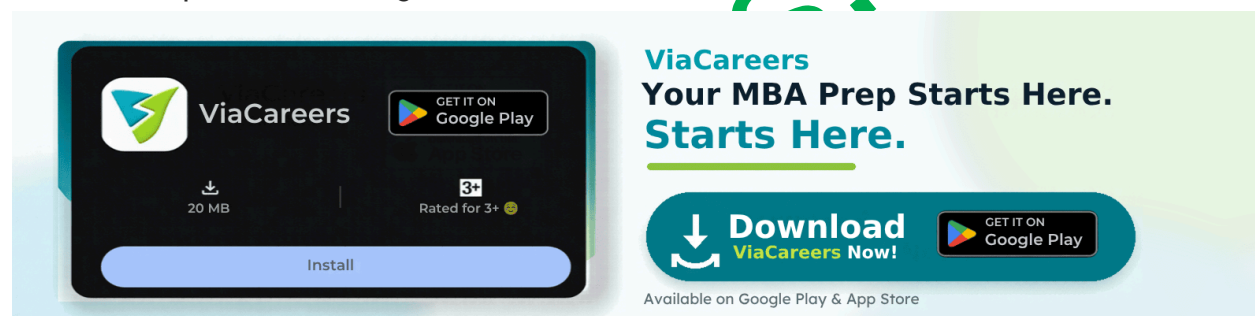
Option D states that the purpose of the line is to indicate that the shopping habits of the

middle class America has changed. However, the author talks about shopping habits towards the end of the passage. The author has not introduced the topic of 'shopping habits' when the given line has been mentioned. Therefore, we can eliminate option D as well.

Option B states that the author uses the line to indicate that the malls and distribution centres are located in the same area. However, the author states that the distribution centres are replacing the malls. He does not intend to convey that they co-exist. Therefore, we can eliminate option B as well.

Option A states that the author uses the line to indicate the irony of the situation. Option A captures the fact that the author finds it ironic that distribution centres are springing up near the places where the malls once existed.

Therefore, option A is the right answer.



15.B

In the first paragraph, the author states that "many of them the brand-name anchor outlets that real estate developers once stumbled over themselves to court", indicating that the brand outlets used to be sought after once but are no longer in demand. The author states that the real estate developers used to fight each other over these outlets earlier. Therefore, we can infer that the real estate developers no longer show the kind of enthusiasm they did (since the outlets are closing down) and hence, option B is the right answer.

16.C

The author calls malls an ecosystem since they served as places of congregation. The author compares the market places from ancient Greece to emphasize how malls, just like the market places through out the history, served as the places of social interaction as well. Only option C captures the fact that malls serves both as commercial and social centres and hence, option C is the right answer.

17.D

The main point that the author places is that malls served as places of social interaction and cannot be reduced to merely places of commercial activity. Therefore, the author compares the malls as America's public square to show the bustling social life that the malls hosted. Therefore, option D is the right answer.

18.A

In the last 2 paragraphs, the author tries to invoke a sense of nostalgia by describing the malls. He tries to make the readers feel the ambiance and vibrance of the malls by taking us down the memory lane.

Option B adopts an objective tone. The author does not merely describe a mall. He tries to invoke our memories of the malls.

Options C and D can be eliminated since the purpose of the author is not to emphasize that all brands were available at one place or to establish the reason for the sweet smell that the malls carried. The author tries to make an emotional appeal and only option A captures this point. Therefore, option A is the right answer.

19.C

In the last paragraph, the author uses the line "They also asserted that isolation and gene flow were less important to evolutionary divergence than natural selection". Also, through the example of checker spot butterflies, the author brings to light the fact that isolation, though a factor, is not very dominant in influencing speciation. Therefore, option C is the right answer.



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20.B

In the second line of the first paragraph, the author mentions that evolutionary changes evolve imperceptibly over time. In the third paragraph, the author mentions that "Isolation and gene flow were less important to evolutionary divergence than natural selection". Therefore, we can infer that gene flow contributes to evolutionary divergence. The author explains that 3 species of checkerspot butterflies living within 50 acres hardly interact with each other. Therefore, we can infer option D. The author mentioned the book "the population bomb" as an introduction to the biologist Paul Ehrlich. Option B cannot be inferred from the passage and hence, it is the right answer.

21.C

The author provides 'Checkerspot butterflies' as an example to drive home his point. The primary intention of the author is not to discuss checkerspot butterflies. Therefore, we can eliminate option D. Option B can be eliminated as well since the author has not mentioned that the theories are widely accepted. The author explains the contrasting views of the scientists to show that speciation is a debated topic. Option A states that evolution is a controversial topic. The passage deals with speciation. We cannot generalize speciation to evolution. Also, the intention of the author is to show the differing views among the scientists rather than to establish that the topic is controversial. Therefore, option C is the right answer.

22.C

The author expresses his views that hosting Olympics cost a lot and the financial prospects are not that good. Towards the end of the first paragraph, he uses the line "Any economic benefit would have to flow from the value of the Games as an advertisement for the city, the new transportation and communications infrastructure that was created for the Games, or the ongoing use of the new facilities". From this line, we can infer that the author states that there are any benefits, it should be from advertisements and the use of the facilities (implying that the other streams are unlikely to yield any revenue).

It has not been mentioned that the 3 committees share the profit equally. Even if they do, it is not the main point that the author intends to convey through the first paragraph. Therefore, we can eliminate option A.

Option B states that the revenue accrues through advertisement and ticket sales. No information has been provided about 'ticket sales' and hence, option B can be eliminated. Option D states that the revenues are usually eroded by the expenditure incurred by host city. The second paragraph builds on revenue from 'advertising and infrastructure' implying that the primary purpose of the first paragraph was to introduce these topics rather than to lament that the expenditure of the host city erodes the revenue.

Therefore, option C is the right answer.

23.A

In the second paragraph, the author mentions that the facilities are not fully utilized due to their sheer capacity.

'The facilities benefit is dubious at best for buildings such as velodromes or natatoriums and problematic for 100,000-seat Olympic stadiums. The latter require a conversion plan for future use, the former are usually doomed to near vacancy'.

Nowhere has it been mentioned that the facilities become outdated or that they are located far from the city. The author mentions in the second paragraph that the structures are expensive to maintain.

Therefore, option A is the right answer.



24.D

We can infer option A from the line 'Even if they have future use, are they the best use of precious urban real estate?'. The author feels that the urban real estate can be put to better use than hosting Olympics.

The author mentions that the fiscal resources can be used for more productive pursuits than hosting Olympics in the last line of the passage.

We can infer option B from the line "Residential areas often are razed and citizens relocated".

Option D cannot be inferred from the passage and hence, it is the right answer.

25.C

The author states that a classic is not which puts him at the centre of the universe but one which gives access to radically different forms of human consciousness.

Let us evaluate the options.

Option A states that a classic should focus on unified human experience. The author mentions the exact opposite in the paragraph. Therefore, we can eliminate option A. We can eliminate option D too since it mentions the polar opposite of what that is mentioned in the paragraph. The author is of the view that a classic should go beyond providing a unified human experience and expose one to radically different forms of human consciousness. We can eliminate option B since it states that a classic focuses on common humanity. Only option C captures the essence of the given paragraph and hence, option C is the right answer.

26. C

Let us note down the important points put down by the author.

Indians have better knowledge of their culture. A westerner might be fluent in the language but will find it hard to relate to the culture. Indians, on the other hand, might be less fluent in the language but will be able to preserve the culture when a text is translated. Therefore, Indians should translate Indian texts.

Let us evaluate the options now. Option A states that Indians and Westerners face the same challenges but they have different skill sets. Indians and Westerners face different challenges while translating the text. Indians face difficulty in the language and westerners face difficulty in relating to the culture. Therefore, we can eliminate option A.

Option D fails to capture the fact that the primary intention of the paragraph is not to pit Indians against westerners but to suggest that Indians should translate Indian texts.

Also, it does not capture the fact that Indians will retain the advantage only when translating the Indian texts. Therefore, we can eliminate option D.

Option B, though true, fails to capture the India-centric angle that the paragraph adopts. The paragraph places huge emphasis on the term 'Indian texts' and only option C manages to capture this fact. Also, only option C captures the fact that it is easier to remedy errors in the language than to fix errors in the interpretation of culture. Therefore, option C is the right answer.

27.C

Let us note down the important points in the given paragraph.

Global warming does not cause storms but make them more powerful. Due to the increase in the temperature, the air can absorb more moisture. This relationship (the change in the ability to absorb water with the increase in the temperature) is given by the Clausius-Clapeyron equation. Let us evaluate the options.

The author provides storm Harvey as an example to illustrate how increased temperatures can arm the storms with more power. Harvey is not the central theme of the given paragraph. We can eliminate options A and D since option D places much emphasis on storm Harvey and option A states that there is no relationship between the increase in temperature and the power of storms.

Option B states that the Clausius-Clapeyron equation cannot predict the quantum of

destruction that a storm might cause. This point is totally out of context with respect to what that is being discussed in the paragraph. Therefore, we can eliminate option B as well.

Option C precisely explains the mechanism through which global warming makes the modern storms more destructive.

Therefore, option C is the right answer.



28.54132

A quick glance at all the five questions suggest that the passage is discussing tradition and innovation. Hence, 5 is the best opening sentence as it sets the context for the discussion. 4 and 1 form a pair as both of them talk about handing down. Similarly, 3, 2 also form a pair as both talk about selections. Hence, the correct logical order of the given sentences will be 54132.

29.15243

After reading all the given sentences, we know that the paragraph is about the gene editing and a specific disease where the process has been used effectively. Statement 1 is the opening sentences introducing the topic that how for the first time scientists have managed to edit gene. Statement 5 provides the specifics of the case where the gene editing has taken place. 'The cardiac disease' mentioned in statement 2 refers to hypertrophic cardiomyopathy discussed in statement 5. So, statement 2 must follow statement 5. Statement 4 explains the causes of the of the disease mentioned in statement 2. Statement 3 is a conclusion about the result of the process explained earlier. Thus, the correct order is 1 - 5 - 2 - 4 - 3. Hence, 15243 is the correct answer.

30.54123

On carefully reading the sentences, we see that the paragraph is about the disease - black plaque and its impact on migration. Sentence 5 introduces the subject. Hence, it should be the opening sentence of the paragraph.

Sentence 4 should follow 5 as 4 talks about the bronze age skeletons, which are mentioned in 5. Sentence 1 should follow 4 as 'the study' refers to the analysis of skeletons mentioned in 4. Sentences 2 and 3 form a pair as 2 mentions that the oldest sample was found in Russia and 3 mentions that this could have been the reason for mass exodus. 54123 forms a coherent paragraph.

31.32145

3 is the starting sentence of the given paragraph as it introduces us the topic.

2 follows 3 as it further talks about what's given in 3 as can be understood by "There is absolutely nothing new about us framing the vision" and this vision talked about in 3.

1 follows 2 as "This visual turn" has its precedent is in 2. The visual turn in 1 is explained in 2.

5 concludes the summary and it also follows 4 as "What is unprecedented is not the desire to put out newsfeeds related to the self" given in 5 is explained in 4.

Hence, the correct order is 32145.

32.3

After reading all the sentences, we know that the paragraph is about the children's language and the signs that they show. Statement 1 is the opening sentence as it introduces us to the method adopted to study children's language. Statement 2 further explains the method how people study the signs given by children. Statements 4 and 5 are about the signs mentioned in statement 2. Thus, all the four statements are related to the methodology adopted by people to study children's language. Therefore, these 4 sentences form a paragraph. Statement 3 is about the reaction of children to a certain language. So, statement 3 is about a different topic

and does not fit in the paragraph.

Hence, 3 is the correct answer.



33.4

After reading all the sentences, we know that the passage is about the study of the effect of exercise on the mind by the neuroscientists. Statement 1 is the opening sentence as it introduces the main idea and suggests that neuroscientists have started studying the effect of exercise on the mind. Statement 2 discusses the findings of the study mentioned in statement 1. Statement 3 further elaborates the finding and explains the reasons behind the effect of exercise on brain cells. Statement 5 is a conclusion sentence based on the study mentioned in the three sentences mentioned earlier. Thus, 1235 forms a meaningful paragraph.

Statement 4 focuses on our ignorance of movements due to the widespread use of technology. Other four sentences are about the relationship between exercise and brain cells. However, statement 4 is about a different topic. Therefore, statement 4 is an odd sentence which does not fit in the paragraph.

Hence, 4 is the correct answer.

34.1

On reading the sentences, we can infer that the paragraph is about how Mars lost most of its water.

Sentence 5 states that Mars has lost much of its water according to one study but some liquid water remains according to another. Therefore, the rest of the paragraph should explain about these 2 findings.

Sentences 4 and 2 together substantiate the first study. They try to explain how a solar

storm swept away Mar's water content. Both the sentences talk about the solar storm. Sentence 3 talks about the water that is remaining on the planet. Sentences 5423 can be put together into a coherent paragraph.

Therefore, sentence 1 is the odd one out.

DILR

35.B

It is given that

1 burger takes 10 minutes

1 ice cream takes 2 minutes and 3 portions of fries take 5 min by the machine (operator is not required).

Client 1 ordered 1 burger, 3 portions of fries and 1 ice cream.

The burger will take 10 minutes to finish. Meantime, rest of the order can be completed.

36.C

It is given that

1 burger takes 10 minutes

1 ice cream takes 2 minutes and 3 portions of fries take 5 min by the machine (operator is not required).

Anish or Bani cannot start preparing a new order while a previous order is being prepared.

The first order will be completely done at 10:10.

The second order is two fries and one ice cream, which will be done by 10:15.

The third order is one 1 burger and 1 portion of fries.

The burger will take 10 minutes, by which fries will be ready.

Thus, the third order will be completed by 10:25.

37.A

It is given that

1 burger takes 10 minutes

1 ice cream takes 2 minutes and 3 portions of fries take 5 min by the machine (operator is not required).

The employees are allowed to process multiple orders at a time, but the preference would be to finish orders of clients who placed their orders earlier.

The first order is 1 burger, 1 ice cream and 3 portions of fries.

Anish can start working on the burger and Bani can start working on the ice cream for the first client at 10:00.

The burger will be done at 10:10, ice - cream at 10:02 and fries at 10:05.

The second order is placed at 10:05. (ice cream and fries)

Bani can work on the ice cream for the second client at 10:05 and also put the fries.

The ice cream will be done by 10:07 but the fries will be done by 10:10.

Thus, order will be completed by 10:10.



38.B

It is given that

1 burger takes 10 minutes

1 ice cream takes 2 minutes and 3 portions of fries take 5 min by the machine (operator is not required).

The employees are allowed to process multiple orders at a time, but the preference would be to finish orders of clients who placed their orders earlier.

The first order is 1 burger, 1 ice cream and 3 portions of fries.

Anish can start working on the burger and Bani can start working on the ice cream.

The burger will be done at 10:10, ice - cream at 10:02 and fries at 10:05.

The second order is placed at 10:05. (ice cream and fries)

Bani can work on the ice cream from 10:05 and also put the fries.

Only Bani will be free from 10:02 to 10:05 - 3 minutes.

The ice cream will be done by 10:07 but the fries will be done by 10:10.
Third order of 1 burger and 1 fries is placed at 10:07.
Bani will immediately start working on the burger. He will finish it by 10:17.
Anish would have finished the first burger at 10:10. Only he is free till 10:17 - 7 minutes.
Thus exactly one person is free for 10 minutes.

Explanation [39 - 42]:

Let us make note of the information given in the set.

The set states that rural kids were surveyed from 3 regions NE, West and South.
50 students each were surveyed from 150 villages in the NE, 250 villages from the West and 200 villages from the South.

Total number of kids from the NE = $150 \times 50 = 7500$

Total number of kids from the West = $250 \times 50 = 12500$

Total number of kids from the South = $200 \times 50 = 10,000$.

The table, given in the question, gives the number of students whose mothers dropped out before completing primary education. Therefore, the mothers of the remaining students should have completed primary education.

There are 7500 students from the NE in total. The mothers of 5000 of those students dropped out before completing primary education. Therefore, the remaining 2500 kids should have mothers who have completed primary education.

Let us make 2 tables - one representing the number of students and the other representing the number of students whose mother has completed primary education.

55% of the surveyed kids studied in schools run by the Government.

Number of kids studying in Govt. School should be $0.55 \times 30000 = 16,500$

From the given table, we know that the mothers of 13,500 kids who went to Govt. Schools dropped out of primary school.

Therefore, the remaining $16,500 - 13,500 = 3000$ kids should have mother who have completed primary school. 37% of the surveyed kids study in private schools.

Number of kids studying in private schools should be $0.37 \times 30000 = 11,100$.

Number of kids in private schools whose mothers have completed primary school = $11,100 - 2700 = 8400$.

8% of the surveyed kids did not go to school.

Number of kids who did not go to school = $0.08 \times 30000 = 2400$

Number of kids not going to schools whose mothers have completed primary school = $2400 - 1800 = 600$.

In S, 60% of the surveyed kids were in G.

Therefore, 6000 kids in S must be from G.

In NE, among the O kids, 50% had mothers who had dropped out before completing primary education.

There are 300 O kids whose mothers dropped out before completing primary education. These kids represent 50% of the total number of O-kids. Therefore, there must be 600 O-kids from NE - 300 kids should have mothers who dropped out before completing primary education and 300 kids should have mothers who have completed primary education.

The number of kids in G in NE was the same as the number of kids in G in W. Therefore, the number of kids in G in NE and the number of kids in G in W should be equal to 5250.

Total number of kids:

	G	P	O	Total
NE	5250	1650	600	7500
W	5250			12500
S	6000			10000
Total	16,500	11,100	2,400	30,000

Number of kids whose mothers have completed primary education:

	G	P	O	Total
NE	1050	1150	300	2500
W	1050			5200
S	900			4300
Total	3000	8400	600	12000

We have been given that in S, all surveyed kids whose mothers had completed primary education were in school. Therefore, the number of kids not going to school whose mothers have completed primary education in S should be 0. Filling the tables, we get,

Total number of kids:

	G	P	O	Total
NE	5250	1650	600	7500
W	5250	5750	1500	12500
S	6000	3700	300	10000
Total	16,500	11,100	2,400	30,000

Number of kids whose mothers have completed primary education:

	G	P	O	Total
NE	1050	1150	300	2500
W	1050	3850	300	5200
S	900	3400	0	4300
Total	3000	8400	600	12000



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39.A

As we can see from the table, 3700 kids out of the 10,000 kids from S are studying in P. 37% of the total number of students from S were studying in P. Therefore, option A is the right answer.

40.A

There are 300 students who are not in school in W whose mothers have completed primary education. Therefore, option A is the right answer.

41.A

Number of kids who were out of school in the initial survey = 2400.

The number of kids who were out of school in NE is 600, W is 1500 and S is 300. 25% of the kids from one area, 100% of the kids from one area and 50% of the kids from another area are transferred to G. As a result, the number of kids who were not in school earlier but studying in G now became 50% of 2400 = 1200.

100% of the kids in W could not have been transferred to G (Since the total number of kids transferred to G is 1200 and the number of kids in W alone is 1500).

Let us assume that 100% of the kids from NE transferred (600). In this case, if 25% of the kids from W are transferred (375), 50% of the kids from S (300) will be transferred. The total in this case would be $600 + 375 + 300 = 1275$. Therefore, we can eliminate this case.

If 100% of the kids from NE (600), 25% of the kids from S (75) and 50% of the kids from W (750) are transferred, then the total would have been 1425. Therefore, we can eliminate this case as well.

If 50% of the kids from W (750), 25% of the kids from NE (150) and 100% of the kids from S (300) are transferred, then the total number of kids transferred to G would have been $750 + 150 + 300 = 1200$. Therefore, this must have been the case.

Number of students transferred to G in W = 750.

Number of students present in G in W earlier = 5250

Total = 6000

Therefore, option A is the right answer.

42.A

Number of kids who were out of school in the initial survey = 2400.

The number of kids who were out of school in NE is 600, W is 1500 and S is 300. 25% of the kids from one area, 100% of the kids from one area and 50% of the kids from another area are transferred to G. As a result, the number of kids who were not in school earlier but studying in G now became 50% of $2400 = 1200$.

100% of the kids in W could not have been transferred to G (Since the total number of kids transferred to G is 1200 and the number of kids in W alone is 1500).

Let us assume that 100% of the kids from NE transferred (600). In this case, if 25% of the kids from W are transferred (375), 50% of the kids from S (300) will be transferred.

The total in this case would be $600 + 375 + 300 = 1275$. Therefore, we can eliminate this case.

If 100% of the kids from NE (600), 25% of the kids from S (75) and 50% of the kids from W (750) are transferred, then the total would have been 1425. Therefore, we can eliminate this case as well.

If 50% of the kids from W (750), 25% of the kids from NE (150) and 100% of the kids from S (300) are

transferred, then the total number of kids transferred to G would have been $750 + 150 +$

$300 = 1200$. Therefore, this must have been the case.

Already, 5100 kids whose mothers had dropped out were in G in S.

After the transfer, 300 more students will be added to the count.

Therefore, 5400 students whose mothers had dropped out will be in G in S.

Total number of kids whose mothers had dropped out in S = 5700

Percentage = $5400/5700 = 94.73\%$.

Therefore, option A is the right answer.



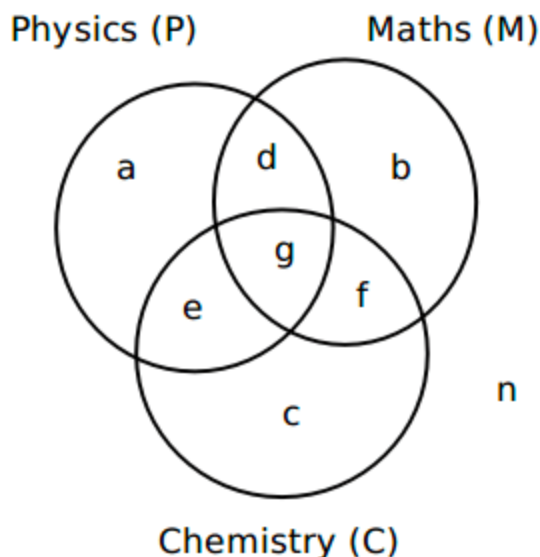
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43.A

It is given that 200 candidates scored above 90th percentile overall in CET. Let the following Venn diagram represent the number of persons who scored above 80 percentile in CET in each of the three sections:



From (1), $n = 0$

From (2), $d + e + f = 150$

From (3), $a = b = c$

Since, there are a total of 200 candidates

$$a + b + c + g = 200 - 150 = 50$$

$$3a + g = 50 \Rightarrow a < 17$$

$$\text{From (4), } (b + f + c) : (a + d + b) : (a + e + c) = 4 : 2 : 1$$

$$\text{Or } (2a + f) : (2a + d) : (2a + e) = 4 : 2 : 1$$

$$\text{or, } 6a + (d + e + f) = 7x$$

$$\text{Or, } 6a + 150 = 7x$$

So, a can be 3 or 10

x can be 24 or 30

$$2a + e \text{ can be } 24 \text{ or } 30 \Rightarrow e \text{ can be } 18 \text{ or } 10$$

$$2a + d \text{ can be } 48 \text{ or } 60 \Rightarrow d \text{ can be } 42 \text{ or } 40$$

$$2a + f \text{ can be } 96 \text{ or } 120 \Rightarrow f \text{ can be } 90 \text{ or } 100$$

$$3a + g = 50 \Rightarrow g \text{ can be } 41 \text{ or } 20$$

Among the candidates who are at or above 90th percentile, the candidates who are at or above 80th percentile

in at least two sections are selected for AET. Hence, the candidates represented by d , e , f and g are selected for AET.

BIE will consider the candidates who are appearing for AET and are at or above 80th percentile in P. Hence, BIE

will consider the candidates represented by d , e and g , which can be 104 or 80.

BIE will conduct a separate test for the other students who are at or above 80th percentile in P. Given that there

are a total of 400 candidates at or above 80th percentile in P, and since there are 104 or 80 candidates at or

above 80th percentile in P and are at or above 90th percentile overall, there must be 296 or 320 candidates at or

above 80th percentile in P who scored less than 90th percentile overall.

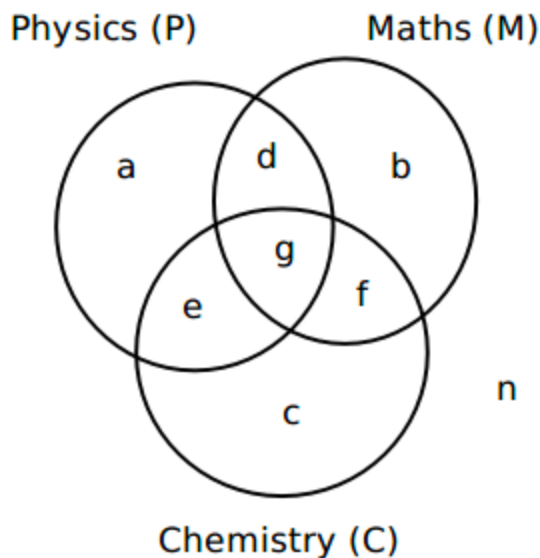
a can be 3 or 10

Hence, Option A is the correct answer.



44.60

It is given that 200 candidates scored above 90th percentile overall in CET. Let the following Venn diagram represent the number of persons who scored above 80 percentile in CET in each of the three sections:



From (1), $n = 0$

From (2), $d + e + f = 150$

From (3), $a = b = c$

Since, there are a total of 200 candidates

$$a + b + c + g = 200 - 150 = 50$$

$$3a + g = 50 \Rightarrow a < 17$$

$$\text{From (4), } (b + f + c) : (a + d + b) : (a + e + c) = 4 : 2 : 1$$

Or $(2a + f) : (2a + d) : (2a + e) = 4 : 2 : 1$

or, $6a + (d + e + f) = 7x$

Or, $6a + 150 = 7x$

So, a can be 3 or 10

x can be 24 or 30

$2a + e$ can be 24 or 30 $\Rightarrow e$ can be 18 or 10

$2a + d$ can be 48 or 60 $\Rightarrow d$ can be 42 or 40

$2a + f$ can be 96 or 120 $\Rightarrow f$ can be 90 or 100

$3a + g = 50 \Rightarrow g$ can be 41 or 20

Among the candidates who are at or above 90th percentile, the candidates who are at or above 80th percentile

in at least two sections are selected for AET. Hence, the candidates represented by d , e , f and g are selected for AET.

BIE will consider the candidates who are appearing for AET and are at or above 80th percentile in P. Hence, BIE

will consider the candidates represented by d , e and g , which can be 104 or 80.

BIE will conduct a separate test for the other students who are at or above 80th percentile in P. Given that there

are a total of 400 candidates at or above 80th percentile in P, and since there are 104 or 80 candidates at or

above 80th percentile in P and are at or above 90th percentile overall, there must be 296 or 320 candidates at or

above 80th percentile in P who scored less than 90th percentile overall.

From the given condition, g is a multiple of 5.

So, $g = 20$

The number of candidates at or above 90 percentile overall and at or above 80th percentile in both P and M =

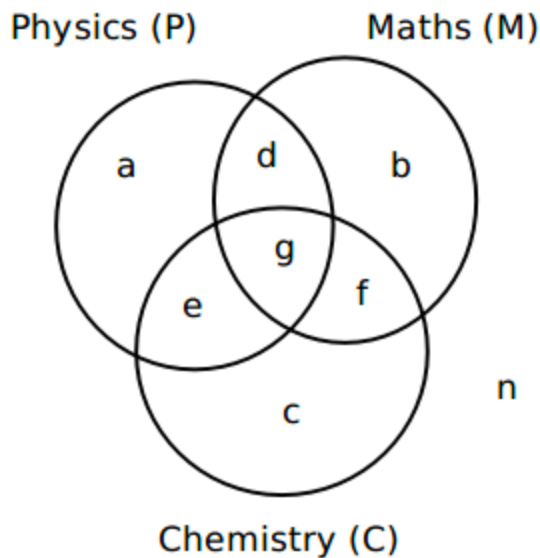
$d + g = 60$.

Hence, 60 is the correct answer.

45.170

It is given that 200 candidates scored above 90th percentile overall in CET. Let the

following Venn diagram represent the number of persons who scored above 80 percentile in CET in each of the three sections:



From (1), $n = 0$

From (2), $d + e + f = 150$

From (3), $a = b = c$

Since, there are a total of 200 candidates

$$a + b + c + g = 200 - 150 = 50$$

$$3a + g = 50 \Rightarrow a < 17$$

From (4), $(b + f + c) : (a + d + b) : (a + e + c) = 4 : 2 : 1$

$$\text{Or } (2a + f) : (2a + d) : (2a + e) = 4 : 2 : 1$$

$$\text{or, } 6a + (d + e + f) = 7x$$

$$\text{Or, } 6a + 150 = 7x$$

So, a can be 3 or 10

x can be 24 or 30

$$2a + e \text{ can be } 24 \text{ or } 30 \Rightarrow e \text{ can be } 18 \text{ or } 10$$

$$2a + d \text{ can be } 48 \text{ or } 60 \Rightarrow d \text{ can be } 42 \text{ or } 40$$

$$2a + f \text{ can be } 96 \text{ or } 120 \Rightarrow f \text{ can be } 90 \text{ or } 100$$

$$3a + g = 50 \Rightarrow g \text{ can be } 41 \text{ or } 20$$

Among the candidates who are at or above 90th percentile, the candidates who are at or above 80th percentile

in at least two sections are selected for AET. Hence, the candidates represented by $d, e,$

f and g are selected for AET.

BIE will consider the candidates who are appearing for AET and are at or above 80th percentile in P. Hence, BIE

will consider the candidates represented by d, e and g, which can be 104 or 80.

BIE will conduct a separate test for the other students who are at or above 80th percentile in P. Given that there

are a total of 400 candidates at or above 80th percentile in P, and since there are 104 or 80 candidates at or

above 80th percentile in P and are at or above 90th percentile overall, there must be 296 or 320 candidates at or

above 80th percentile in P who scored less than 90th percentile overall.

In this question, $g = 20$.

Number of candidates shortlisted for AET

$$= d + e + f + g$$

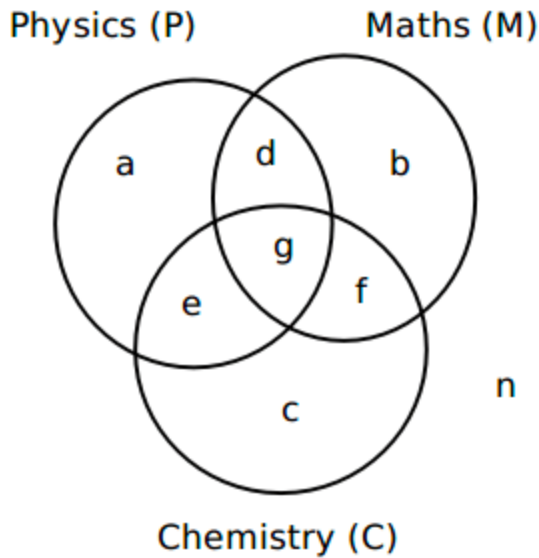
$$= 40 + 10 + 100 + 20$$

$$= 170$$

Hence, 170 is the correct answer.

46.A

It is given that 200 candidates scored above 90th percentile overall in CET. Let the following Venn diagram represent the number of persons who scored above 80 percentile in CET in each of the three sections:



From (1), $n = 0$

From (2), $d + e + f = 150$

From (3), $a = b = c$

Since, there are a total of 200 candidates

$$a + b + c + g = 200 - 150 = 50$$

$$3a + g = 50 \Rightarrow a < 17$$

From (4), $(b + f + c) : (a + d + b) : (a + e + c) = 4 : 2 : 1$

$$\text{Or } (2a + f) : (2a + d) : (2a + e) = 4 : 2 : 1$$

$$\text{or, } 6a + (d + e + f) = 7x$$

$$\text{Or, } 6a + 150 = 7x$$

So, a can be 3 or 10

x can be 24 or 30

$$2a + e \text{ can be } 24 \text{ or } 30 \Rightarrow e \text{ can be } 18 \text{ or } 10$$

$$2a + d \text{ can be } 48 \text{ or } 60 \Rightarrow d \text{ can be } 42 \text{ or } 40$$

$$2a + f \text{ can be } 96 \text{ or } 120 \Rightarrow f \text{ can be } 90 \text{ or } 100$$

$$3a + g = 50 \Rightarrow g \text{ can be } 41 \text{ or } 20$$

Among the candidates who are at or above 90th percentile, the candidates who are at or above 80th percentile

in at least two sections are selected for AET. Hence, the candidates represented by d , e , f and g are selected for AET.

BIE will consider the candidates who are appearing for AET and are at or above 80th percentile in P. Hence, BIE will consider the candidates represented by d, e and g, which can be 104 or 80. BIE will conduct a separate test for the other students who are at or above 80th percentile in P. Given that there are a total of 400 candidates at or above 80th percentile in P, and since there are 104 or 80 candidates at or above 80th percentile in P and are at or above 90th percentile overall, there must be 296 or 320 candidates at or above 80th percentile in P who scored less than 90th percentile overall. From the given condition, the number of candidates at or above 90th percentile overall and at or above 80 percentile in P in CET = $(3 + 18 + 42 + 41) = 104$. The number of candidates who have to sit for separate test = $(400 - 104 + 3) = 296 + 3 = 299$ (we have added 3 for those who have scored more than 80 percentile only in P which is 'a'). Hence, option A is the correct answer.



47.1

The frequency distribution is:

S: 3,3,3,4,4,4,5,5,6,7

F: 1,1,2,3,3,4,5,5,5,7

C: 1,2,2,2,3,3,3,4,6

or

S: 3,3,3,4,4,4,5,5,6,7

F: ~~1~~,~~1~~,2,3,3,4,5,5,7

C: 1,2,~~2~~,~~2~~,3,3,3,4,6

48. 6

The frequency distribution is:

S: ~~3~~,~~3~~,3,4,4,4,5,5,6,7

F: ~~1~~,~~1~~,2,3,3,4,5,5,7

C: 1,2,2,2,~~3~~,3,3,4,6

or

S: 3,3,3,~~4~~,~~4~~,4,5,5,6,7

F: ~~1~~,~~1~~,2,3,3,4,5,5,7

C: 1,2,~~2~~,~~2~~,3,3,3,4,6

Zooma(Z) has a total score of 17 (comes under happy category), and other 2 countries, which are categorized as happy, have the highest score in exactly one parameter.

Suppose the other two countries are P and Q

Z have two possibilities for S, F, C : (6,7,4) & (6,5,6)

All the other cases are negated because "All the 3 countries, which are categorised as happy, have the highest score in exactly one parameter."

For Example : 7,7,3 is not possible because 7 being the highest score is there in two parameters.

So, it scored 6 in S in both the cases.

49. B

S: 3,3,3,4,4,4,5,5,6,7

F: 1,1,2,3,3,4,5,5,5,7

C: 1,2,2,2,3,3,3,3,4,6

Benga and Delma, two countries categorized as happy, are tied with the same total score.

The best numbers remaining are 7,5,6 which adds upto 18, If Benga scores 18, then Delma can't score 18.

Similarly both can't score 17 and 16. Both can score 15 and their distribution will be:

Benga: 7,5,3

Delma: 4,5,6 or 5,4,6



50. B

S: 3,3,3,4,4,4,5,5,6,7

F: 1,1,2,3,3,4,5,5,5,7

C: 1,2,2,2,3,3,3,3,4,6

Given that Benga scores 16, and Delma scores 15.

The possibility is Benga: 5,5,6 and Delma: 7,5,3

If Benga's distribution is 7,3,6 then Delma can't score 15.

Strike off those numbers.

S: 3,3,3,4,4,4,5,5,6,7

F: 1,1,2,3,3,4,5,5,5,7

C: 1,2,2,2,3,3,3,3,4,6

We have to maximum number of countries with score 13. This score does not comes under the category of happy. So to score 13, the distribution can be 5,5,3. Hence, maximum 1 country is possible.

Explanation [51 - 54]:

The table looks like this in Month 1.

	SE	RE
T1	4	1
T2	3	1
T3	2	2
T4	1	3
T5	0	4

Table in month 2. (after exchanging employees according to conditions)

	SE	RE
T1	1	3
T2	4	1
T3	2	2
T4	2	2
T5	1	3

Table in month 3



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	SE	RE
T1	0	4
T2	1	3
T3	4	1
T4	3	1
T5	2	2

Table in month 4.

	SE	RE
T1	0	4
T2	1	3
T3	2	2
T4	5	0
T5	2	2

Table in month 5.

	SE	RE
T1	0	4
T2	0	4
T3	2	2
T4	4	0
T5	4	1

51.B

T2 remained unchanged in Month 3 and Month 4, and composition of T4 was never unchanged. Hence (1,0)

52.A

Refer to table of Month 3, the number of SE employees in T1 and T5 are respectively (0,2)

53.B

When challenging project is given, each employee gets 40 points.

When standard project is given, each employee gets 25 points.

Suppose:

If a particular employee is involved in all standard projects then his credit points will be:

125 If a particular employee is involved in 4 standard projects and 1 challenging project then his credit points will be: 140

If a particular employee is involved in 3 standard projects and 2 challenging projects then his credit points will be: 155

If a particular employee is involved in 2 standard projects and 3 challenging projects then his credit points will

be: 170

If a particular employee is involved in 1 standard project and 4 challenging projects then his credit points will be: 185

If a particular employee is all challenging projects then his credit points will be: 200

Hence, an employee cannot earn 150 points.



54.D

Check option A,

It is possible to move to T2 after working in T1 for the first month. From T2, either movement to T3 or T4 is possible. If moved to T3, then in next month he can move to T4, because of challenging project. Hence this option can be true. Check option B,

It is possible to move to T2 after working in T1 for the first month. From T2, either movement to T3 or T4 is possible. If moved to T4, next movement can be in T5. Hence this option can be true.

Check option C,

T2, T3, T4, T5. This sequential movement is also possible.

Check option D,

If Aneek is there in T1 for the first month, then he will shift to T2, T5 or remain in T1 in the subsequent month. Consider he remained in T1, then he will either move to T5 or remain in T1. So, if this happens the sequence given in option can never follow.

Suppose he has shifted to T2, but T2 is not mentioned in option, so ruled out.

And if he moved to T5, in the next month then he will remain there only.

Hence option D is not correct.

55.C

The table represent the platforms and by how many platforms can it be reached. For example, in row 1 and column 1, platform with height 6 can be reached by 3 people.

6(3)	1(0)	2(1)	4(3)	3(0)
9(4)	5(2)	3(2)	2(0)	8(5)
7(1)	8(4)	4(1)	6(6)	5(1)
3(1)	9(4)	5(3)	1(0)	2(1)
1(0)	7(2)	6(2)	3(1)	9(6)

Hence, there are a total of 7 people.

56.D

Since, we have been given that a person can be reached only by those who are smaller than him. Hence, 1 cannot be reached by anyone. Thus, option D is the correct answer.

57.C

Check out the options.

In last row, only one individual can't be reached by anyone.

In the fourth row, only one individual can't be reached by anyone.

In the middle column, every individual can be reached by atleast another individual.

In the fourth column, both 1 and 2 cannot be reached by any person. Hence, fourth column is the correct answer.

58.C

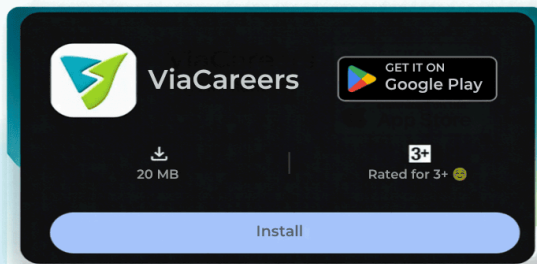
Let us go by options.

Option A: In first row, 6 is reached by 3, 1 by none, 2 by none, 4 by 3, 3 by none. Hence, ruled out.

Option B: Third row, every individual is approached by other.

Option D: In first row, 6 is reached by 3, 1 by none, 2 by none, 4 by 3, 3 by none. Hence, ruled out.

Hence, Option C is correct.



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59.C

There are ten cities. We need to find the minimum number of flights required to travel from any city to any city.

Any two cities can be selected in $10C2$ ways. Now for these two cities, a person will need minimum 4 flights. (1 to go from A to B, 1 to go from B to A. Similarly, 1 to return to A and 1 to return to B) Thus, minimum number of required flights = $45 \times 4 = 180$.

60.C

From each hub, there will be flights to 7 cities. So total total number of flights originating or terminating at each hub = $7 \times 4 = 28$. For all three hubs, it would be $28 \times 3 = 84$

There are three hubs in total. Each hub must also be interconnected. The total number of flights between any two hubs will be 4. For three hubs it will be 12.

Hence, the required number will be $84 + 12 = 96$.

61.40

In G1, we have three cities namely A, B, C. Person living in any of these three cities should be able to travel to other city once in the morning and one in the night. Therefore, a total of 4 flights are required between a pair of cities.

A $\rightarrow$ B (Morning flight)

A $\rightarrow$ B (Evening flight)

B → A (Morning flight)

B → A (Evening flight)

Number of flights between the cities of G1 = $3 \times 2 \times 4 = 12$

Between cities in A and any city in G2 = $3 \times 4 = 12$

Between B and any city in G3 = $2 \times 4 = 8$

Between C and any city in G4 = $2 \times 4 = 8$

Total = $12 \times 2 + 8 \times 2 = 40$

62.4

The cities those were a part of G2 will be shifted to either G3 or G4 but that will not have any impact on the number of the total flights from G1. The only reduction which will take place due to the number of flights shutting down from A to C.

Hence, the maximum reduction in the number of direct flights as compared to the situation before the operational difficulties arose = 4

Alternate method :

Let us determine the number of flights under new conditions.

Flights between A and B = 4

Between B and any city in G3 = $4 \times 4 = 16$

Between C and B = 4

Between C and any city in G4 = $4 \times 4 = 12$

Hence, total flights = 36

Thus, reduction = $40 - 36 = 4$

63.2

Since there are two routes i.e A-M-B and A-N-B and four cars, then 2 cars must be allowed to take each route. In case if one car tried to break rule, then its travel time will increase. Now assume that on route A-M-B three cars are allowed and on route A-N-B one car is allowed, then one car running on A-M-B can break the rule and reduce its travel time. Hence, two cars must be allowed on each route.



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64.B

Since, two cars are allowed on each route, The A-M part and N-B will take same time. The difference will be in travelling M-B part and A-N part, and that difference is 0.1 minute. In route M-B car will take $20 + 0.9 = 20.9$ min and in route A-N car will take $20 + 1 = 21$ min. So difference = 0.1 min

65.2

Case 1: Let us assume 1 car takes AMB route, 3 cars take ANB route

Then travel time of AMB will be $A-M + M-B = 6 + 20 = 26$

Then travel time of ANB will be $A-N + N-B = (20+2) + (6+3*2) = 34$

Now, one car(A) travelling on ANB broke the rule and decided to move on AMB route. then

Case 2: Let us assume 2 cars take AMB route, 2 cars take ANB route

Then travel time of AMB will be $A-M + M-B = (6+3) + (20+0.9) = 29.9$

Then travel time of ANB will be $A-N + N-B = (20+1) + (6+3) = 30$

Since the car A reduced its time from 34 to 29.9, the case-1 route is not optimal, hence case 1 is invalid.

Now, one car(B) travelling on ANB broke the rule and decided to move on AMB route. then, case

Case 3: Let us assume 3 cars take AMB route, 1 car take ANB route

Then travel time of AMB will be $A-M + M-B = (6+3*2) + (20+0.9*2) = 33.8$

Then travel time of ANB will be $A-N + N-B = (20) + (6) = 29$

Now, one car(C) travelling on AMB broke the rule and decided to move on AMNB route. then

Case 4: Let us assume 2 cars take AMB route, 1 car take AMNB route and other take ANB route.

Then travel time of AMB will be $A-M + M-B = (6+3*2) + (20+0.9) = 32.9$

Then travel time of AMNB will be $A-M + M-N + N-B = (6+3*2) + (7) + (6+3) = 28$

Then travel time of ANB will be $A-N + N-B = (20) + (6+3) = 29$

Since this car(C) reduced its time from 33.8 to 28, the route is not optimal, hence case 3 is invalid.

Since this car(B) reduced its time from 30 to 28, the route is not optimal, hence case 2 is invalid.

Now, one car(D) travelling on AMB broke the rule and decided to move on AMNB route. then

Case 5: Let us assume 1 car takes AMB route, 2 cars take AMNB route and other takes ANB route.

Then, the portion A-M will be travelled by 3 cars, M-B by one car, M-N by 2 cars, A-N by 1 car and N-B by 3 cars.

Then, travel time of AMB will be $A-M + M-B = (6+3*2) + (20) = 32$

Then, travel time of AMNB will be $A-M + M-N + N-B = (6+3*2) + (7+1) + (6+3*2) = 32$

Then, travel time of ANB will be $A-N + N-B = (20) + (6+3*2) = 32$

It is clear that the car D reduced its time from 32.9 min to 32 min if it broke the rule.

Hence, case 4 is invalid.

In this arrangement of case 5, no car can improve their travel time by changing their path

Hence, the optimal allocation will be to order 2 cars on A-M-N-B route.

66.B

From the previous question we have found that

1 car take AMB route, 2 cars take AMNB route and other take ANB route.

Then the portion A-M will be travelled by 3 cars, M-B by one car, M-N by 2 cars, A-N by 1 car and N-B by 3 cars.

Then travel time of AMB will be $A-M + M-B = (6+3*2) + (20) = 32$

Then travel time of AMNB will be $A-M + M-N + N-B = (6+3*2) + (7+1) + (6+3*2) = 32$

Then travel time of ANB will be $A-N + N-B = (20) + (6+3*2) = 32$

The minimum travel time from A to B is 32 min.



QUANT

67. 20

Let Arun's current age be A. Hence, Barun's current age is 2.5A

Let Arun's age be half of Barun's age after X years.

Therefore, $2*(X+A) = 2.5A + X$

Or, $X = 0.5A$

Hence, Barun's age increased by $0.5A/2.5A = 20\%$

68.15

Let the rate of work of a person be x units/day. Hence, the total work = 120x.

It is given that one first day, one person works, on the second day two people work and so on.

Hence, the work done on day 1, day 2,... will be x, 2x, 3x, ... respectively.

The sum should be equal to 120x.

$$120x = x * \frac{n(n+1)}{2}$$

$$n^2 + n - 240 = 0$$

n = 15 is the only positive solution.

Hence, it takes 15 days to complete the work.

69. 11

It is given that the maximum weight limit is 630. The lightest person's weight is 53 Kg and the heaviest person's

weight is 57 Kg.

In order to have maximum people in the lift, all the remaining people should be of the lightest weight possible,

which is 53 Kg.

Let there be n people.

$$53 + n(53) + 57 = 630$$

n is approximately equal to 9.8. Hence, 9 people are possible.

Therefore, a total of $9 + 2 = 11$ people can use the elevator.

70. 20

We see that the man saves 20 minutes by changing his speed from 12 Km/hr to 15 Km/hr.

Let d be the distance

Hence,

$$\frac{d}{12} - \frac{d}{15} = \frac{1}{3}$$

$$\frac{d}{60} = \frac{1}{3}$$

$$d = 20 \text{ Km.}$$

71. 70000

Let his total savings be $100x$.

He invests $50x$ in fixed deposits. 30% of $50x$, which is $15x$ is invested in stocks and $35x$ goes to savings bank.

It is given $85x = 59500$

$$x = 700$$

$$\text{Hence, } 100x = 70000$$

72.D

Let the retail price be M and cost price be C .

$$\text{Given, } 0.85 M = 1.02 C$$

$$M = 1.2 C$$

If he wants 20% profit he has to sell at $1.2C$, which is nothing but the retail price

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73. B

Let the speed of the river be x and the speed of the boat be u . Let d be the one way distance and t be the initial time taken.

Given,

$$t = \frac{d}{u-x} + \frac{d}{u+x} \dots i$$

Also,

$$\frac{t}{4} = \frac{d}{2u-x} + \frac{d}{2u+x}$$

$$t = \frac{4d}{2u-x} + \frac{4d}{2u+x} \dots ii$$

Equating both i and ii,

$$\frac{d}{u-x} + \frac{d}{u+x} = \frac{4d}{2u-x} + \frac{4d}{2u+x}$$

$$\frac{2u}{u^2 - x^2} = \frac{16u}{4u^2 - x^2}$$

$$4u^2 - x^2 = 8u^2 - 8x^2$$

$$\frac{u^2}{x^2} = \frac{7}{4}$$

$$\frac{u}{x} = \frac{\sqrt{7}}{2}$$

74.A

Given,

$$C1 : C2 : C3 = 9 : 10 : 8 \dots i$$

$$C2 : C4 : C5 = 18 : 19 : 20 \dots \text{ii}$$

Let's multiply i by 9 and ii by 5

$$C1 : C2 : C3 = 81 : 90 : 72$$

$$C2 : C4 : C5 = 90 : 95 : 100$$

$$\text{Therefore, } C1 : C2 : C3 : C4 : C5 = 81 : 90 : 72 : 95 : 100$$

Given,

$$100x - 81x = 19$$

$$x = 1$$

$$\text{Hence, total profit} = 100 + 95 + 72 + 90 + 81 = 438$$

75.D

Let the number of girls be $2x$ and number of boys be x .

$$\text{Girls getting admission} = 0.6x$$

$$\text{Boys getting admission} = 0.45x$$

$$\text{Number of students not getting admission} = 3x - 0.6x - 0.45x = 1.95x$$

$$\text{Percentage} = (1.95x/3x) * 100 = 65\%$$



76.A

The ratio of L, S, J for popcorn = $7 : 17 : 16$

Let them be 7, 17 and 16

The ratio of L, S, J for chips = $6 : 15 : 14$

Let them $6y$, $15y$ and $14y$

Given, $40x = 35y$, $x = \frac{7y}{8}$

Jumbo popcorn = $16x = 16 * \frac{7y}{8} = 14y$

Hence, the ratio of jumbo popcorn and jumbo chips = 1 : 1

77.B

Let the cost of good mangoes be $2x$ per kg. The cost of medium mangoes be x per kg.

CP of good mangoes = $160x$

CP of medium mangoes = $40x$

His selling price = $0.9 * 2x = 1.80x$

Therefore, total revenue generated by selling all the mangoes = $120 * 1.8x = 216x$

Hence, the profit % = $\frac{16x}{200x} * 100 = 8\%$

78.D

Let the cost price be C and the marked price be M .

Given,

$0.6 M = 1.2 C$

$M = 2C$

CP of 60 toys = $60C$

Now only 50 are remaining.

Hence,

$M (1 - d) * 50 = 72C$

$1 - d = 0.72$

$d = .28$

Hence 28%

79.D

Since the square root can be positive or negative we will get two cases for each of the equation.

For the first one,

$$a + 3 = 3b \dots i$$

$$a + 3 = -3b \dots ii$$

For the second one,

$$a - 1 = 2(b - 1) \dots iii$$

$$a - 1 = 2(1 - b) \dots iv$$

we have to solve i and iii, i and iv, ii and iii, ii and iv.

Solving i and iii,

$a + 3 = 3b$ and $a = 2b - 1$, solving, we get $a = 3$ and $b = 2$, which is not what we want.

Solving i and iv

$a + 3 = 3b$ and $a = 3 - 2b$, solving, we get $b = 1.2$, which is not possible.

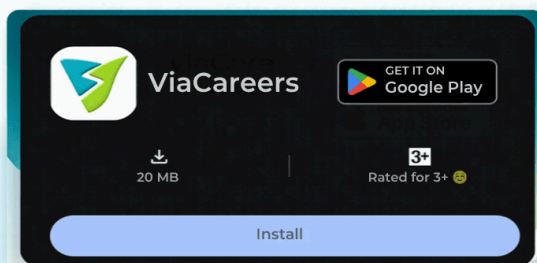
Solving ii and iii

$a + 3 = -3b$ and $a = 2b - 1$, solving, we get $b = 0.4$, which is not possible.

Solving ii and iv,

$a + 3 = -3b$ and $a = 3 - 2b$, solving, we get $a = 15$ and $b = -6$ which is what we want.

Thus, $\frac{a^2}{b^2} = \frac{25}{4}$

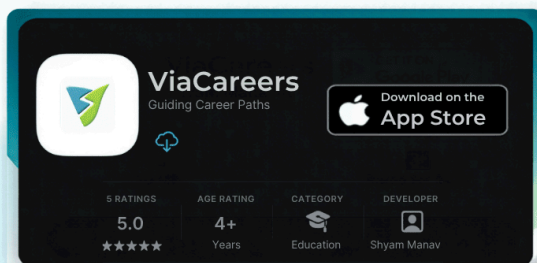


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80. A

Let, the average score of boys in the mid semester exam is A .

Therefore, the average score of girls in the mid semester exam be $A+5$.

Hence, the total marks scored by the class is $20 \times (A) + 30 \times (A + 5) = 50 \times A + 150$

The average score of the entire class is $\frac{(50 \times A + 150)}{50} = A + 3$

wkt, class average increased by 2, class average in final term = $(A + 3) + 2 = A + 5$

Given, that score of girls dropped by 3, i.e $(A + 5) - 3 = A + 2$

Total score of girls in final term = $30 \times (A + 2) = 30A + 60$

	MID-TERM		FINAL-TERM	
No Boys/Girls	Avg score	Total score	Avg score	Total score
20	A	$20A$		
30	$A+5$	$30A+150$	$A+2$	$30A+60$
Class score		$50A+150$		
Class Average		$A+3$		$A+5$

Total class score in final term = $(A + 5) \times 50 = 50A + 250$

the total marks scored by the boys is $(50A + 250) - (30A - 60) = 20A + 190$

Hence, the average of the boys in the final exam is $\frac{(20A + 190)}{20} = A + 9.5$

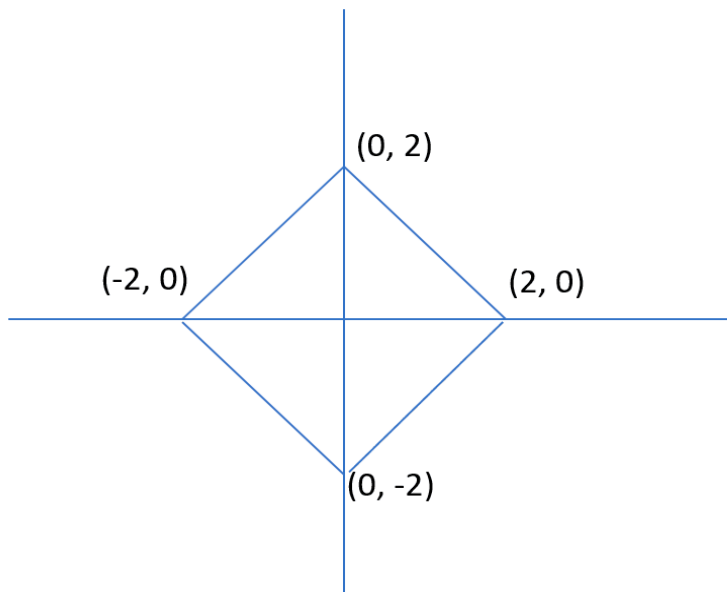
	MID-TERM		FINAL-TERM	
No Boys/Girls	Avg score	Total score	Avg score	Total score
20	A	$20A$	$A+9.5$	$20A+190$
30	$A+5$	$30A+150$	$A+2$	$30A+60$
Class score		$50A+150$		$50A+250$
Class Average		$A+3$		$A+5$

Hence, the increase in the average marks of the boys is $(A + 9.5) - A = 9.5$

81. C

The following equation will form a square of side $2\sqrt{2}$.

The area of the square = $(2\sqrt{2})^2 = 8$ units.



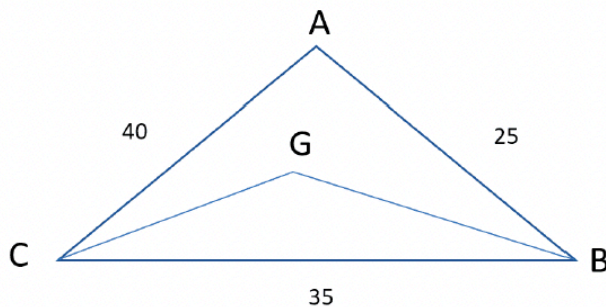
82. B

The lengths are given as 40, 25 and 35.

The perimeter = 100

Semi-perimeter, $s = 50$

$$\text{Area} = \sqrt{50 * 10 * 25 * 15} = 250\sqrt{3}$$



The triangle formed by the centroid and two vertices is removed.

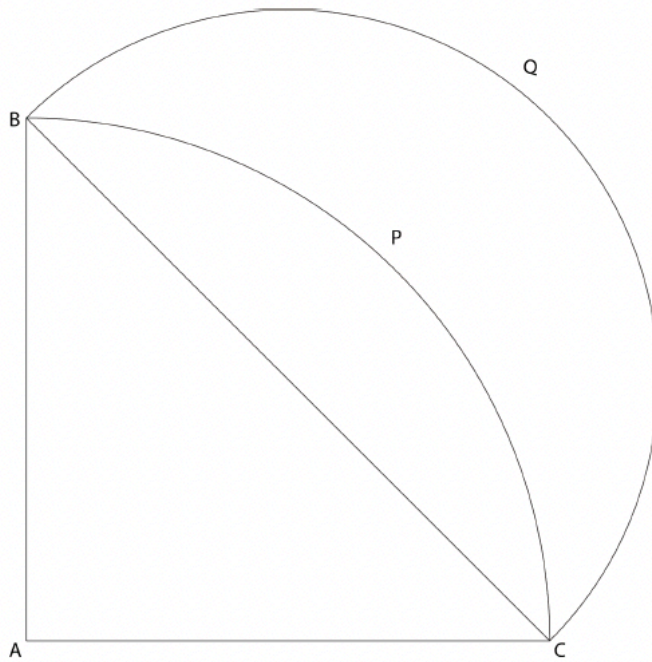
Since the centroid divides the median in the ratio 2 : 1

The remaining area will be two-thirds the area of the original triangle.

$$\text{Remaining area} = \frac{2}{3} * 250\sqrt{3} = \frac{500}{\sqrt{3}}$$

83.B

The image of the figure is as shown.



$AB = AC = 6\text{cm}$. Thus, $BC = \sqrt{6^2 + 6^2} = 6\sqrt{2}\text{ cm}$

The required area = Area of semi-circle BQC - Area of quadrant BPC + Area of triangle ABC

Area of semicircle BQC

Diameter $BC = 6\sqrt{2}\text{cm}$

Radius $= 6\sqrt{2}/2 = 3\sqrt{2}\text{ cm}$

Area $= \pi r^2/2 = \pi * (3\sqrt{2})^2/2 = 9\pi$

Area of quadrant BPC

Area $= \pi r^2/4 = \pi * (6)^2/4 = 9\pi$

Area of triangle ABC

Area $= 1/2 * 6 * 6 = 18$

The required area = Area of semi-circle BQC - Area of quadrant BPC + Area of triangle ABC

$= 9\pi - 9\pi + 18 = 18$

84. **B**

Let the volumes of the five cubes be $x, x, 8x, 27x$ and $27x$.

Let the sides be $a, a, 2a, 3a$ and $3a$. ($x = a^3$)

Let the side of the original cube be A .

$$A^3 = x + x + 8x + 27x + 27x$$

$$A = 4a$$

$$\text{Original surface area} = 96a^2$$

$$\text{New surface area} = 6(a^2 + a^2 + 4a^2 + 9a^2 + 9a^2) = 144a^2$$

$$\text{Percentage increase} = \frac{144-96}{96} * 100 = 50\%$$

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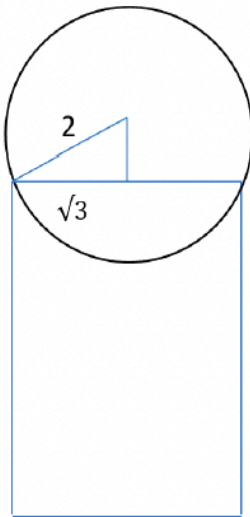
85. 6

The volume of a cylinder is $\pi * r^2 * 3 = 9\pi$

$$r = \sqrt{3} \text{ cm.}$$

Radius of the ball is 2 cm. Hence, the ball will lie on top of the cylinder.

Lets draw the figure.



Based on the Pythagoras theorem, the other leg will be 1 cm.

Thus, the height will be $3 + 1 + 2 = 6$ cm

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86. 24

The length of the altitude from A to the hypotenuse will be the shortest distance.

This is a right triangle with sides 3 : 4 : 5.

Hence, the hypotenuse = $\sqrt{20^2 + 15^2} = 25$ Km.

Length of the altitude = $\frac{15 \cdot 20}{25} = 12$ Km

(This is derived from equating area of triangle, $\frac{15 \cdot 20}{2} = \frac{25 \cdot \text{altitude}}{2}$)

The time taken = $\frac{12}{30} \times 60 = 24$ minutes

87. D

We know that $\log_3 x = a$ and $\log_{12} y = a$

Hence, $x = 3^a$ and $y = 12^a$

Therefore, the geometric mean of x and y equals $\sqrt{x \times y}$

This equals $\sqrt{3^a \times 12^a} = 6^a$

Hence, $G = 6^a$ Or, $\log_6 G = a$

88. D

We know that $x^2 - x - 1 = 0$

Therefore $x^4 = (x + 1)^2 = x^2 + 2x + 1 = x + 1 + 2x + 1 = 3x + 2$

Therefore, $2x^4 = 6x + 4$

We know that $x > 0$ therefore, we can calculate the value of x to be $\frac{1+\sqrt{5}}{2}$

Hence, $2x^4 = 6x + 4 = 3 + 3\sqrt{5} + 4 = 3\sqrt{5} + 7$

89. C

$\log_{0.008} \sqrt{5} + \log_{\sqrt{3}} 81 - 7$

$81 = 3^4$ and $0.008 = \frac{8}{1000} = \frac{2^3}{10^3} = \frac{1}{5^3} = 5^{-3}$

Hence,

$\log_{0.008} \sqrt{5} + 8 - 7$

$\log_{5^{-3}} 5^{\frac{1}{2}} + 8 - 7$

$\frac{\log 5^{0.5}}{\log 5^{-3}} + 1$

$-\frac{1}{6} + 1$

$= \frac{5}{6}$

90. B

$$\frac{81^x}{9} - \frac{81^x}{81} = 1944$$

$$81^x * \left[\frac{1}{9} - \frac{1}{81}\right] = 1944$$

$$81^x * \left[\frac{1}{81}\right] = 243$$

$$3^{4x} = 3^9$$

$$x = \frac{9}{4}$$

91. B

$$x - y - z = 25 \text{ and } x \leq 40, y \leq 12, z \leq 12$$

If $x = 40$ then $y + z = 15$. Now since both y and z are natural numbers less than 12, so y can range from 3 to 12 giving us a total of 10 solutions. Similarly, if $x = 39$, then $y + z = 14$. Now y can range from 2 to 12 giving us a total of 11 solutions.

If $x = 38$, then $y + z = 13$. Now y can range from 1 to 12 giving us a total of 12 solutions.

If $x = 37$ then $y + z = 12$ which will give 11 solutions.

Similarly on proceeding in the same manner the number of solutions will be 10, 9, 8, 7 and so on till 1.

Hence, required number of solutions will be $(1 + 2 + 3 + 4 + \dots + 12) + 10 + 11$

$$= 12 * 13 / 2 + 21$$

$$78 + 21 = 99$$

92. 11

$$(n - 5)(n - 10) - 3(n - 2) \leq 0$$

$$\Rightarrow n^2 - 15n + 50 - 3n + 6 \leq 0$$

$$\Rightarrow n^2 - 18n + 56 \leq 0$$

$$\Rightarrow (n - 4)(n - 14) \leq 0$$

$\Rightarrow$ Thus, n can take values from 4 to 14. Hence, the required number of values are $14 - 4 + 1 = 11$.



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93.24

$$f_1(x) = x^2 + 11x + n \text{ and } f_2(x) = x$$

$$f_1(x) = f_2(x)$$

$$\Rightarrow x^2 + 11x + n = x$$

$$\Rightarrow x^2 + 10x + n = 0$$

$\Rightarrow$ For this equation to have distinct real roots, $b^2 - 4ac > 0$

$$10^2 > 4n$$

$$\Rightarrow n < 100/4$$

$$\Rightarrow n < 25$$

Thus, largest integral value that n can take is 24.

94.2

For the value of given expression to be minimum, the values a, b, c of and should be as close as possible. $30/4 = 7.5$. Since each one of these are integers so values must be 8, 8, 7, 7. On putting these values in the given expression, we get

$$(8 - 8)^2 + (8 - 7)^2 + (8 - 7)^2$$

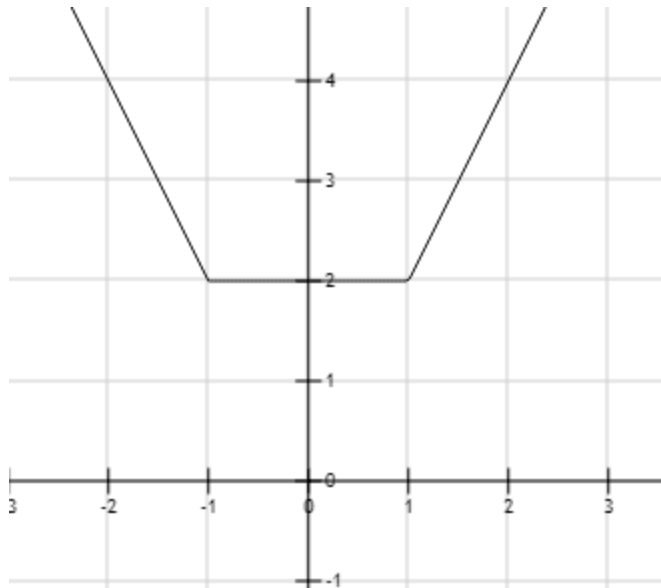
$$\Rightarrow 1 + 1 = 2$$

95.160

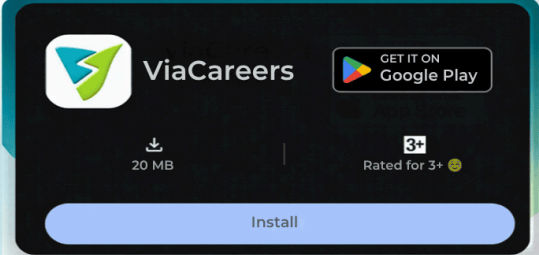
The total number of given points are 11. (10 on circumference and 1 is the center) So total possible triangles = ${}^{11}C_3 = 165$. However, AOB, COD, EOF, GOH, JOK lie on a straight line. Hence, these 5 triangles are not possible. Thus, the required number of triangles = $165 - 5 = 160$

96.A

The graph of the given function is as shown below.



We can see that the shortest distance of the point $(1/2, 1)$ will be 1 unit.



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97. A

The seventh term of an AP = $a + 6d$. Third term will be $a + 2d$ and second term will be $a + 16d$. We are given that

$$(a + 6d)^2 = (a + 2d)(a + 16d)$$

$$\Rightarrow a^2 + 36d^2 + 12ad = a^2 + 18ad + 32d^2$$

$$\Rightarrow 4d^2 = 6ad$$

$$\Rightarrow d : a = 3 : 2$$

We have been asked about $a:d$. Hence, it would be 2:3

98. A

We have been given that $a + b + c + d = 7$

Total ways of distributing 7 things among 4 people so that each one gets at least one = ${}^{n-1}C_{r-1} = {}^6C_3 = 20$

Now we need to subtract the cases where any one person got more than 3 erasers. Any person cannot get more than 4 erasers since each child has to get at least 1. Any of the 4 child's can get 4 erasers. Thus, there are 4 cases. On subtracting these cases from the total cases we get the required answer. Hence, the required value is $20 - 4 = 16$

99. A

$$f(3) = \frac{15+2}{9-5} = \frac{17}{4}$$

$$f(f(3)) = \frac{5 \cdot 17/4 + 2}{3 \cdot 17/4 - 5} = \frac{93/4}{31/4} = \frac{93}{31} = 3$$

$$g(f(f(3))) = 3^2 - 3 \cdot 2 - 1 = 2$$

100. B

$a_1 = 3$ and $a_2 = 7$. Hence, the common difference of the AP is 4. If we assume, $k=3n$

We have been given that the sum up to $3n$ terms of this AP is 1830. Hence, $1830 = \frac{k}{2}[2 \cdot 3 + (k-1) \cdot 4]$

$$\Rightarrow 1830 \cdot 2 = k(6 + 4k - 4)$$

$$\Rightarrow 3660 = 2k + 4k^2$$

$$\Rightarrow 2k^2 + k - 1830 = 0$$

$$\Rightarrow (k-30)(2k+61) = 0$$

$$\Rightarrow k = 30 \text{ or } k = -61/2$$

Since k is the number of terms so k cannot be negative. Hence, must be 30

$$\text{So, } 3n = 30$$

$$n = 10$$

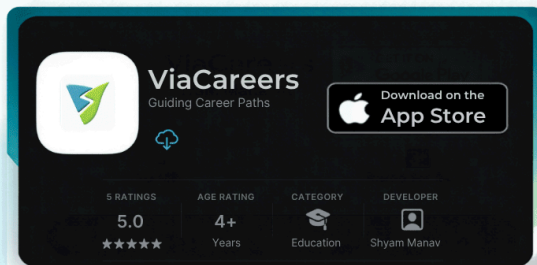
$$\text{Sum of the first '10' terms of the given AP} = 5 \cdot (6 + 9 \cdot 4) = 42 \cdot 5 = 210$$

$$m(a_1 + a_2 + \dots + a_n) > 1830$$

$$\Rightarrow 210m > 1830$$

$$\Rightarrow m > 8.71$$

Hence, smallest integral value of ' m ' is 9.



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