NTSE STAGE – I
02 – A/2017 – 18 (For Class – X)
MENTAL ABILITY TEST (MAT)
HINTS & SOLUTIONS

1. 2

1. $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{8}}+\frac{1}{\sqrt{8}+\sqrt{9}}$

$\left[\left(\frac{1}{\sqrt{2}+1}\times\frac{\sqrt{2}-1}{\sqrt{2}-1}\right)+\left(\frac{1}{\sqrt{3}+\sqrt{2}}\times\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}\right)+\left(\frac{1}{\sqrt{4}+\sqrt{3}}\times\frac{\sqrt{4}-\sqrt{3}}{\sqrt{4}-\sqrt{3}}\right)+...+\left(\frac{1}{\sqrt{9}+\sqrt{8}}\times\frac{\sqrt{9}-\sqrt{8}}{\sqrt{9}-\sqrt{8}}\right)\right]$

$\Rightarrow\left[\left(\sqrt{2}-1\right)+\left(\sqrt{3}-\sqrt{2}\right)+\left(\sqrt{4}-\sqrt{3}\right)+...+\left(\sqrt{9}-\sqrt{8}\right)\right]$

$\Rightarrow\left(-1+\sqrt{9}\right)=-1+3=2$

2. **No option correct.**

3. 3

3. $\frac{n(n-3)}{2}=35$

$n^2-3n-70=0$

n = 10

$\frac{(n-2)\times180}{n}=\frac{8\times180}{10}=144^0$

4. 4

4. $15-2\div900+90\times100=?$

$\Rightarrow 15\times2+900\div90-100=15\times2+10-100$

$\Rightarrow 30+10-100=40-100=-60$

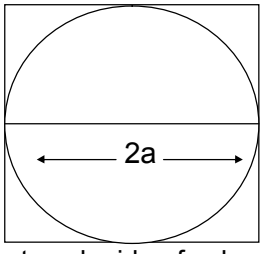
5. 4

5. $(k+1)x^2-5x+2k=0$

Product of roots = $\alpha.\frac{1}{\alpha}=\frac{2k}{k+1}$

$\Rightarrow$ k + 1 = 2k $\Rightarrow$ k = 1

6. 2

6. 

Let each side of cube = 2a

$\therefore$ diameter of sphere = 2a

$$\therefore \frac{\text{Vol. of cube}}{\text{Vol of sphere}} = \frac{(2a)^3}{\frac{4}{3}\pi(a)^3} = \frac{8a^3}{\frac{4}{3}\pi a^3} = \frac{6}{\pi}$$

7. 2

7. $2x^2 - 5x + 16 = 0$

$$\left(\frac{\alpha^2}{\beta}\right)^{\frac{1}{3}} + \left(\frac{\beta^2}{\alpha}\right)^{\frac{1}{3}}$$

$$= \frac{\alpha^{2/3}.\alpha^{1/3} + \beta^{2/3}.\beta^{1/3}}{(\alpha\beta)^{1/3}} = \frac{\alpha+\beta}{(\alpha\beta)^{1/3}} = \frac{5/2}{2} = \frac{5}{4}$$

8. 1

8. Divided = Divisor x Quotient + Rem
Quotien = 10
$\therefore$ divisor = 100
& remainder = 10
$\therefore$ divided = 100 x 10 + 10 = 1010

9. 2

9. $\left[(0.111)^3 + (0.222)^3 - (0.333)^3 + (0.333)^2(0.222)\right]^2$
Taking common (0.111)
$(0.111)^3 + (0.111)^3(2)^3 - (0.111)^3(3)^3 + (0.111)^2(3)^2(0.111)(2)$
$= (0.111)^3(1+8-27+18)$
= 0

10. 2

10. $9^{2n} - 4^{2n}$ is of form $a^n - b^n$ (where n is even)
Therefore $a^n - b^n$ is always divisible by $(a-b)$ & $(a+b)$
So it is divisible by (9 + 4) and (9 – 4) i.e., 5 and 13

11. 1

11. LCM + HCF = 50
LCM – HCF = 20
$\therefore$ LCM = 35 & HCF = 15
$\therefore$ product of number = LCM x HCF
= 35 x 15
= 525

12. 1

12. Speed of train = $\frac{\text{length of train} + \text{length of platform}}{\text{time taken by train}}$

$\Rightarrow 120 \times \frac{5}{18} = \frac{320+x}{24}$ (Let length of platform be x m)

$\therefore$ x = 480 m

$\therefore$ Speed of man = $\frac{\text{length of platform}}{\text{time taken by man}}$

$= \frac{480}{4 \times 60} = 2\text{m/sec}$

13. 4

13. $\frac{a^{n+1}+b^{n+1}}{a^n+b^n} = \frac{a+b}{2}$ when (n = 0)

$\Rightarrow$ value of n = 0

14. 3

14. Let total workers = x

$\therefore$ women = $\frac{1}{3}x$

$\therefore$ men = $\frac{2}{3}x$

Women with children = $\frac{1}{3}\times\frac{1}{2}\times\frac{1}{3}x = \frac{x}{18}$

Men with children = $\frac{3}{4}\times\frac{2}{3}\times\frac{2x}{3} = \frac{x}{3}$

Worker with children = $\frac{x}{18}+\frac{x}{3} = \frac{7x}{18}$

Worker without children = $x - \frac{7x}{18} = \frac{11}{18}$ of x

15. 4

15. Let Akash earns x rs. As profit

Then Alok earns = $x + \frac{75x}{100} = \frac{175x}{100} = \frac{7x}{4}$

$\therefore$ Akash's profit is less than Alok by

$= \frac{\frac{7x}{4}-x}{\frac{7x}{4}}\times 100$

$= \frac{\frac{3x}{4}}{\frac{7x}{4}}\times 100$

$= \frac{3}{7}\times 100 = 42.85\%$

16. 3

16. Let height of towers, be 5x, 6x, 7x meter respectively

$\therefore$ Speed of spider = $\frac{5x}{15}$ m / min

$\therefore$ Time taken to climb the highest one = $\frac{7x}{\frac{5x}{15}}$

$= \frac{7x\times 15}{5x}$

= 21 min

17. 1

17. Centroid = $\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$

$(0, 1) = \left(\frac{4+2+x_3}{3}, \frac{-2-6+y_3}{3}\right)$

$\therefore \ (x_3, y_3) = (-6, 11)$

18. 1

18. $\cos^2\alpha = \sin\alpha.\tan\alpha$

$\cos^3\alpha = \sin^2\alpha$

$\frac{\cos^2\alpha}{\sin^2\alpha} = \frac{1}{\cos\alpha} \Rightarrow \cot^2\alpha = \frac{1}{\cos\alpha}$

$\cot^6\alpha - \cot^2\alpha = \cot^2\alpha\left(\cot^4\alpha - 1\right)$

$= \frac{1}{\cos\alpha}\left(\frac{1}{\cos^2\alpha} - 1\right)$

$= \frac{1}{\cos\alpha}\left(\frac{\sin^2\alpha}{\cos^2\alpha}\right) = \frac{\sin^2\alpha}{\cos^3\alpha} = 1$

19. 3

19. 7 + 6 + 5 + 4 + 3 + 2 + 1 = 28

20. 2

20. We can choose vertices out of 6 in ${}^6C_3 = 20$ ways

Chosen vertices can form equilateral triangle in just 2 ways

Required probability = $\frac{2}{20} = \frac{1}{10}$

21. 2

21. A = 630
B = 720
C = 1260
D = 675
E = 945
F = 270

males teacher in F = 100
female teacher in C = 28% of 4500 – (600)
= 660

female in B = 16% of 1500 – 400
= 320

$\Rightarrow$ 100 + 660 + 320 = 1080

22. 4

22. $\frac{x}{100} \times 630 = 575 \Rightarrow x = 90\%$

23. 3

23. In B we have 630 total teachers
Male = 400
Female = 230
In E we have 945 total teachers
Male = 500
Female = 445

24. 2

24. Total number of teachers in E = 945

Female teachers in F = 170
Difference = 945 – 170 = 775

25. 3
25. Male in C $\rightarrow$ 600
Female in B $\rightarrow$ 320
$C_M : B_F = 600 : 320 = 15 : 8$

26. 1
26. 25 x 10 + 5 = 255, 255 x10 – 5 = 2545, 2545 x 10 + 5, 25455 x 10 – 5 = 254545

27. 4
27. 4 x 3 = 12 $\rightarrow$ Alphabet position of L
1 x 17 = 17 $\rightarrow$ Alphabet position of Q
5 x 4 = 20 $\rightarrow$ Alphabet position of T

28. 4
28. After removing even numbers
1 5 9 7 1 5 3 5 9 7 5 9 1 3 5 1 3
Answer $\rightarrow$ 9

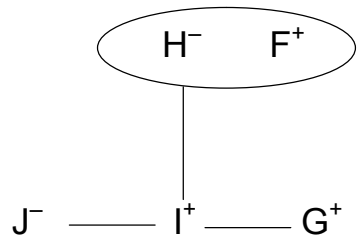
29. 4
29. Total hours = 89 hours
Faulty time 23 hours & 44 min = $23 + \frac{44}{60}$ i.e, $\frac{356}{15}$ hr
$\frac{356}{15}$ hr of incorrect watch = 24 hr of correct watch
$\therefore$ 89 hours of incorrect watch = $\frac{24 \times 15}{356} \times 89 = 90$ hrs
$\therefore$ Actually watch will be 1 hr faster than faulty watch.
i.e., 11 pm

30. 2
30. 1 + 2 + 3 …. 5 6
Sum = $\frac{n(n+1)}{2} = \frac{56 \times 57}{2} = 28 \times 57 = 1596$

31. 2

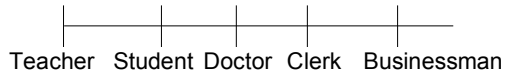
31. Total white box = $\frac{64}{2} = 32$
Now odd in white box = $\frac{32}{2} = 16$

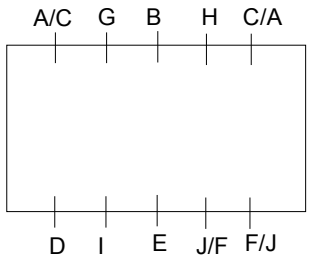
32. 4
32.

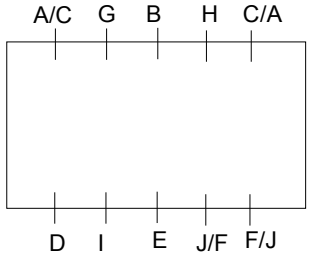


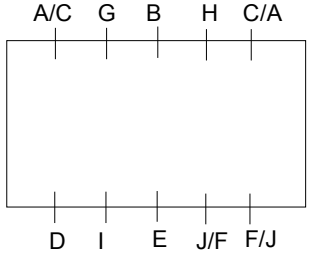
+ means male member
– means female members

⬭ means couple
—— means brother / daughter
| means son / daughter

33. 2
33. 

34. 2
34. 

35. 1
35. 

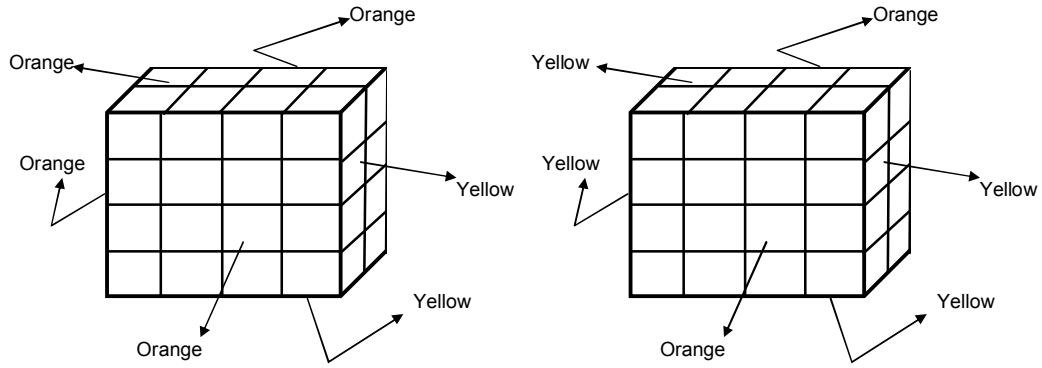
36. 4
36. 

37. 3
37. 1 mango = 4 banana
= 2 apples
= 10 strawberries

38. 2
38. $52 < 4 \wedge 5 > 8 \vee 2$
$52 - 4 \times 5 + 8 \div 2$
$52 - 4 \times 5 + 4$
$56 - 20 = 36$

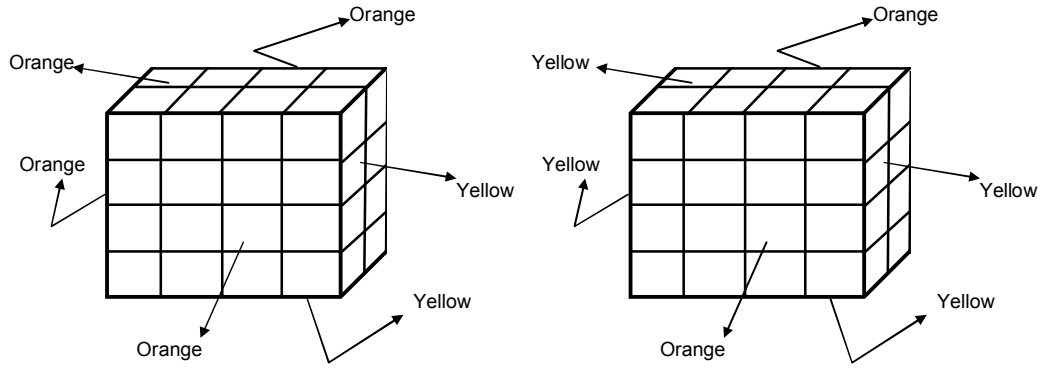
39. 1
39. 4:35
To find mirror image
11:60 – 4:35 = 7:25

40. 1

40. 

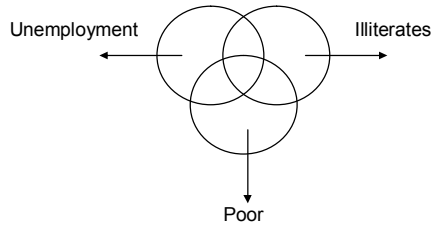
All the smaller cubes have colour on their faces,

41. 2

41. 

The larger faces will have one face coloured cube which is four on each face.
So, in total there are four larger faces.
4 x 4 = 16
16 cubes will have only one face colour.

42. 2

42. 

43. 1

43. By observation

44. 4

44. From one row to another the contents of each cell moves one place towards right.

45. 3

45. By observation

46. 4

46. By observation.

47. 1

47. Blue $\rightarrow$ 2
Sky $\rightarrow$ 1
Was $\rightarrow$ 3
People $\rightarrow$ 8
Like $\rightarrow$ 0
In $\rightarrow$ 6
Birds $\rightarrow$ 9
'People like birds' $\rightarrow$ 809

48. 1

48. 5 x 2 + 2 = 12
12 x 2 + 2 = 26
26 x 2+ 2 = 54

49. 3

49. 9 x (2 + 1) = 27
7 x (3 + 2) = 35
4 x (4 + ?) = 36
? = 9 – 4 = 5

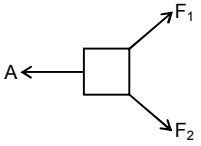
50. 2

50. $\sqrt{64} + \sqrt{36} + \sqrt{49} = 8 + 6 + 7 = 21$
$\sqrt{121} + \sqrt{81} + \sqrt{100} = 11 + 9 + 10 = 30$

NTSE STAGE – I
SCHOLASTIC APTITUDE TEST (SAT)
HINTS & SOLUTIONS

PHYSICS

101. 1

101. 

Minimum number of forces required is 3.

102. 1

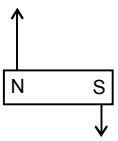
102. Resistance of the heater be R.
New resistance of heater is R/2.

Initial power = $\frac{V^2}{R}$

Final power = $\frac{V^2}{R/2} = 2\frac{V^2}{R}$

$\therefore$ Heat generated is doubled.

103. 3

103. 

Force acting at different part of the magnet is different. So both torque and force will be acting.

104. 2

104. $P = 2 \times 10^3$ watt
Energy in 1 min = $2 \times 10^3 \times 60$ J.
$\Rightarrow$ $2 \times 10^3 \times 60 = m \times 10x\ 10$
$\Rightarrow$ m = 1200 kg ; Volume = 1200 litre.

105. 3

105. Initial velocity = V
Final velocity = V′

$\frac{1}{2}mv^2 \times 4 = \frac{1}{2}m(v')^2$

V′ = 2V.
Initial momentum = mv
Final momentum = 2mv.
$\therefore$ Momentum is doubled.

106. 3

106. Total work done by gravity is zero.

107. 2

107. $\Rightarrow \quad \frac{GM_m \times 80}{(2R_m)^2} = 9.8$

$\Rightarrow \quad \frac{GMm}{Rm^2} = \frac{9.8}{40} = 0.49\ m/s^2$

108. 2

108. $P = P_1 + P_2$

$\Rightarrow \quad P = \frac{1}{f_1} + \frac{1}{f_2}$

$\Rightarrow \quad P = \frac{f_1 + f_2}{f_1 f_2}$

109. 1

109. $\frac{\text{Sin i}}{\text{Sin r}} = \frac{V_1}{V_2}$

$\Rightarrow \quad \frac{\text{Sin } 30}{\text{Sin } 60} = \frac{V}{V'}$

$\Rightarrow \quad V' = \sqrt{3}\, V$

110. 2

110. $\frac{1}{2}g(t)^2 - \frac{1}{2}g(t-2)^2 = 40$

$\Rightarrow \quad 5t^2 - 5(t-2)^2 = 40$

$\Rightarrow \quad t^2 - (t-2)^2 = 8$

$\Rightarrow \quad t = 3$

$\therefore \quad$ height $= \frac{1}{2}gt^2 = \frac{1}{2} \times 10 \times 9 = 45$ m.

111. 4

111. $R = \frac{\rho \ell}{A}$

New area = nA

$\therefore$ New length $= \frac{\ell}{n}$

$\Rightarrow \quad R' = \frac{\rho \ell}{n^2 A} = \frac{R}{n^2}$

112. 3

112. Ammeter has low resistance and due to its resistance current in the circuit decreases.

113. 4

113. As the rays are diverging so the optical device is convex mirror.

114. 4

114. Work is zero only when force and displacement are perpendicular to each other. So, work will be down in all the cases.

CHEMISTRY

115. 2

115. Silver is a good conductor of electricity.

116. 1

116. Cr = [Ar] $4s^1\ 3d^5$

Half filled configuration of d – subshell is more symmetrical.

117. 3

117. Amphoteric.

Al_2O_3 can react with acid and base both.

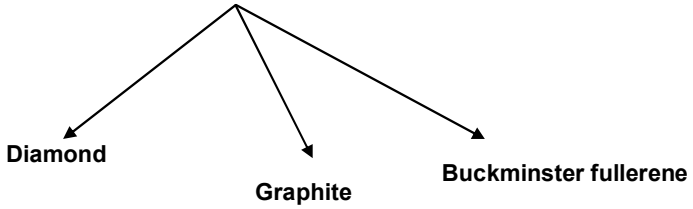
118. 3
118. As Solution is acidic so pH < 7

119. 3
119. In basic solution phenolphthalein shows pink colour.

120. 1
120. 4s, 4p, 4d, 4f
4s = one orbital, 4d = five orbital Total = 7 + 5 + 3 + 1
4p = Three orbital 4f = seven orbital = 16
So, Total no. of electron = 32

121. 1
121. Addition of NaCl results precipitation of soap to separate out soap from the solution. (as in question paper sodium is given which is considered wrong. It should be NaCl)

122. 3
122. There are 3 allotropes of carbon.



123. 2
123. Due to $Ca(NO_3)_2$ & $CaSO_4$.
As oxides of nitrogen & sulphur reacts with limestone on Taj Mahal to form nitrates and sulphates of calcium.

124. 1
124. CO_2, CH_4, N_2O, and O_3
Act as green house gases.

125. 1
125. s, p, d, f subshells are present in an atom.

126. 1
126. Boron and cadmium used in atomic reactors to control speed of neutron.

127. 2
127. $\text{Moles} = \frac{1000}{108} = 9.25$
No. of atoms = $9.25 \times 6.023 \times 10^{23}$
$= 5.571 \times 10^{24}$ atoms

BIOLOGY

128. 2
128. Chromosomes carry genes, which are the hereditary units, which carry hereditary characters to the offspring.

129. 3
129. Mitochondria is called the power house of the cell.

130. 4
130. Plasma membrane is made up of both protein and lipid.

131. 2
131. Oviduct is the site of fertilization in humans.

132. 1
132. Heart never takes rest as it has cardiac muscles which never gets fatigue.

133. 1
133. Lacteal present in the villi of the small intestine help to absorb fatty acids and glycerol.

134. 1
134. The experiment 'origin of primitive life on Earth' was performed by Urey and Miller.

135. 2
135. Bicuspid valve is present in the human heart in between left atrium and left ventricle.

136. 3
136. During the light reaction NADPH and ATP are synthesized which is utilized in dark reaction.

137. 4
137. Grafting in monocot plants is not possible because they have scattered Vascular Bundles.

138. 1
138. Haemophilia disease is linked with sex chromosome.

139. 3
139. The primary building blocks of DNA Nitrogenous base, phosphorus and deoxyribose.

140. 1
140. Islets of Langerhans helps in formation of insulin

MATHEMATICS

141. 4
141. $x^4+4x^3+nx^2+4x+1=\left(ax^2+bx+c\right)^2$

$x^4+4x^3+nx^2+4x+1=a^2x^4+b^2x^2+c^2$
$+2abx^3+2bcx+2acx^2$
$=a^2x^4+2abx^3+\left(b^2+2ac\right)x^2+2bcx+c^2$

Comparing coefficients,

$a^2=1$

$c^2=1$

$2ab=4$

$b^2 + 2ac = n$
$2bc = 4$

Solving, we get $\frac{a}{c} = 1 \Rightarrow a = c$

$b = \pm 2,\ a = \pm 1,\ c = \pm 1$

$\therefore b^2 + 2ac = 4 + 2 = 6$

142. 3

142. Let initial salary be Rs. 100
After 10% reduction, salary = Rs. 90

$\therefore$ Required percent of increase $= \frac{10}{90} \times 100$

$= 11\frac{1}{9}\%$

143. 2

143. Let $\sqrt{x} = a,\ \sqrt{y} = b$

Given equation $a^3 + b^3 = 183$ and $a^2b + ab^2 = 182$

$\Rightarrow (a+b)^3 - 3ab(a+b) = 183$ and $ab(a+b) = 182$

$\Rightarrow (a+b)^3 = 183 + 3 \times 182$

$\Rightarrow a + b = 9$ and $ab = \frac{182}{9}$

Now $\sqrt{x} + \sqrt{y} = 9$ and $\sqrt{xy} = \frac{182}{9}$

So, $x + y = 81 - 2\sqrt{xy} = \frac{365}{9}$

$\Rightarrow \frac{18}{5}(x+y) = 146$

144. 3

144. Minimum value of m + n =
Minimum value of m + minimum value of n
= 9 + 16 = 25

145. 3

145. Let $x = a,\ y = 2b,\ z = 4c$

then $(a)^2 + (2b)^2 + (4c)^2 = 48 \quad \Rightarrow x^2 + y^2 + z^2 = 48$

and $2ab + 8bc + 4ca = 48 \quad \Rightarrow xy + yz + zx = 48$

Now, $(x-y)^2 + (y-z)^2 + (z-x)^2 = 0$

$x = y = z$

$a = 2b = 4c$

$\frac{a}{4} = \frac{b}{2} = \frac{c}{1} = \lambda$

So, $ab + 4bc + 2ca = 4\lambda.2\lambda + 8\lambda.\lambda + 2\lambda.4\lambda = 24$

$\lambda^2(8+8+8) = 24$

$\lambda = \pm 1$

$\Rightarrow a^2 + b^2 + c^2 = 21\lambda^2 = 21$

146. 3

146. By angle sum property of ΔACE and ΔDBF

147. No option is correct

147. $\sin^4 x = \cos^2 x$

$\Rightarrow \left(1-\cos^2 x\right)^2 = \cos^2 x$

$\Rightarrow \cos^4 x - 3\cos^2 x + 1 = 0$

$\Rightarrow \cos^2 x = \dfrac{3-\sqrt{5}}{2}$

Now, $\cos^4 x + \cos^2 x = \left(\dfrac{3-\sqrt{5}}{2}\right)^2 + \left(\dfrac{3-\sqrt{5}}{2}\right)$

$= 5 - 2\sqrt{5}$

148. No option is correct

148. The roots are 1, 2, 3 and k

$1+2+3+k=0$

$k=-6$

$c = 1\times 2\times 3\times -6$

$c = -36$

149. 3

149. $x = 4+\sqrt{15}$

$y = 4-\sqrt{15}$

$x+y=8$

$xy=1$

$x^3+y^3 = (x+y)\left((x+y)^2-3xy\right)$

$= 8(64-3)$

$= 8(61)$

= 488

150. 4

150. AD = 10 cm, BE = 12 cm, CF = 15 cm

Let BC = a cm

AC = b cm

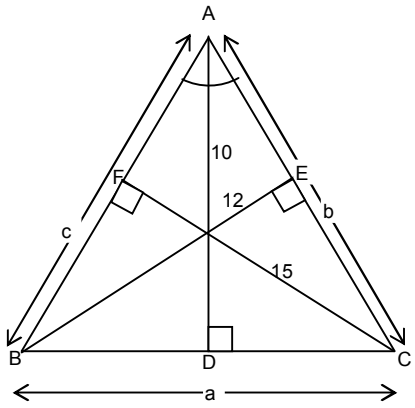
AB = c cm

Area of $\Delta = \dfrac{1}{2}\times 10a = \dfrac{1}{2}\times 12b = \dfrac{1}{2}\times 15c$

$\Rightarrow a:b:c = 6:5:4$

let sides are 6x, 5x and 4x

$\Rightarrow \dfrac{1}{2}\times 10\times 6x = \sqrt{\dfrac{15x}{2}\left(\dfrac{15x}{2}-6x\right)\left(\dfrac{15x}{2}-5x\right)\left(\dfrac{15x}{2}-4x\right)}$



$\Rightarrow x = \frac{8}{\sqrt{7}}$

So, semi perimeter $= \frac{60}{\sqrt{7}}$ cm

151. 3

151. $12\cot^2\theta - 31\operatorname{cosec}\theta + 32 = 0$

$12\left(\operatorname{cosec}^2\theta - 1\right) - 31\operatorname{cosec}\theta + 32 = 0$

$12\operatorname{cosec}^2\theta - 31\operatorname{cosec}\theta + 20 = 0$

$12\operatorname{cosec}^2\theta - 16\operatorname{cosec}\theta - 15\operatorname{cosec}\theta + 20 = 0$

$4\operatorname{cosec}\theta\left(3\operatorname{cosec}\theta - 4\right) - 5\left(3\operatorname{cosec}\theta - 4\right) = 0$

$\operatorname{cosec}\theta = \frac{5}{4}$ or $\frac{4}{3}$ $\Rightarrow \sin\theta = \frac{4}{5}$ or $\frac{3}{4}$

152. **No option is correct**

152. $\frac{1}{2}ac = 16$

$ac = 32$

$ed = 18$

$ab = 50$

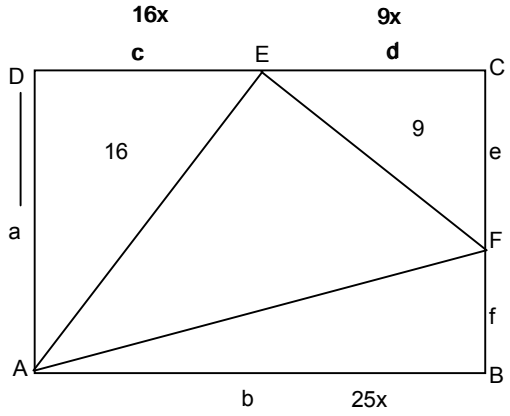
$\frac{c}{b} = \frac{32}{50} = \frac{16}{25}$

$e.\frac{9}{25}b = 18$

$eb = \frac{18 \times 25}{9} = 50$

$e = a\ f = 0$

$\therefore \Delta AEF = 25$



153. 4

153. When side changes from S to 2S volume changes from 2S to $8S^3$

$S \to S^3$

$2S \to 8S^3$

$\therefore$ Increase percent $= \frac{75^3}{5^3} \times 100$

= 700%

154. 2

154. $\frac{V_1}{V_2} = \frac{\pi(2x)^2.5y}{\pi(3x)^2.3y}$

$= \frac{20}{27}$

155. 2

155. Ratio of volumes

$$\frac{1}{3}\pi r^2 : r : \pi r^2 r : \frac{2}{3}\pi r^3$$

$$= \frac{1}{3} : 1 : \frac{2}{3}$$

$$= 1 : 3 : 2$$

156. 1

156. CP of 1 = Rs. 10000

CP of 2 = Rs. 20000

$\therefore$ No profit, No loss

157. 1

157. $a_1 + a_2 + ... + a_7 + a_8 = 160$

$a_1 + a_2 = 31$

$a_3 + a_4 + a_5 = 64$

$a_7 - a_6 = 4$

$a_8 - a_6 = 7$

Solving we get

$a_6 = 18$

$a_7 = 22$

$a_8 = 25$

158. 1

158. $R = \frac{2}{3} \times$ altitude

$$= \frac{2}{3} \times \frac{\sqrt{3}}{2} \times 3\sqrt{3}$$

= 3 cm

159. 2

159. $\frac{1}{9}\sqrt[3]{x} + \frac{2}{9}\sqrt[3]{x} + \frac{1}{6}\sqrt[3]{x} = 1$

$$\sqrt[3]{x}\left(\frac{1}{3} + \frac{1}{6}\right) = 1$$

$$\sqrt[3]{x}\left(\frac{2+1}{6}\right) = 1$$

$$\sqrt[3]{x} = 2$$

$$x = 8$$

160. **No option is correct**

160. $x - 10 = \frac{40}{100} \times x$

$$\Rightarrow \bar{x} = \frac{50}{3}$$

If each observation is increased by 5 then new mean $= \frac{65}{3}$