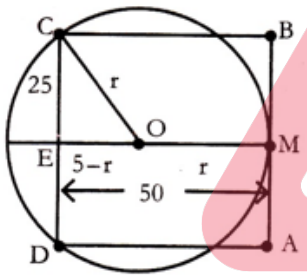
Quantitative Aptitude Mega Quiz for RRB (Solutions)

S1. Ans.(a)
Sol. Lets us assume that 1st side is a, second is b and third is c.
For perimeter to be maximum c should not be the largest side (see the qn).
Let us assume that a is the smallest side (you can assume b also to be the smallest side). So b is the largest side, It is also given that 3a = b
Now 15 + a > b ⟶ b – a < 15 ⟶ 3a – a < 15 ⟶ 2a < 15
So maximum vlaue of a = 7 (integer value)
Hence maximum perimeter = 7 + 21 + 15 = 43 untis

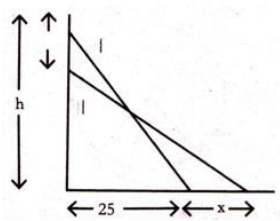
S2. Ans.(b)
Sol. Assume radius of the circle = 'r'. Then in right Δ ECO
hyptoenuse is of lenght r and legs and of lenghts 25 and (50 - r).



So, $25^2 + (50 - r)^2 = r^2 \Rightarrow 625 + (2500 - 100r + r^2) = r^2$
Or, $3125 - 100x = 0 \Rightarrow r = 31.25$

S3. Ans.(d)
Sol. Sum of two side of a triangle is always greater than a third sides of a triangle.
so, 4 + 6 > 12 → which is not possible
It triangle having side 4, 6 & 12 will not be exist.

S4. Ans.(c)
Sol.



Using Pythagorean triples, (5, 12, 13) ⇒ h = 60
After it has slipped by 8 m, new height = 52 m, and length of ladder = 65 m.
So 25 + x = 39 (65^2- 52^2) ⇒ x = 14 m

S5. Ans.(b)

Sol. Maximum length $= \sqrt{(7)^2 + (7)^2 + (8)^2} = \sqrt{162} = 9\sqrt{2}$

S6. Ans.(c)

Sol.

Let r be the radius of the circle

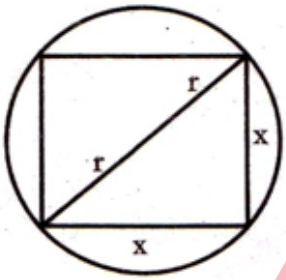
$\therefore 2\pi r = \pi r^2 \Longrightarrow 2r = r^2$

$\Longrightarrow r = 2 \Longrightarrow 2r = 4$

S7. Ans.(b)

Sol.

Radius of the circle = r



Diagonal of the square = 2r

A = area of the square = $x^2 = 2r^2$

And ABCDEF is the hexagon

$\Delta AB0$ is equilateral, area of $\Delta = \frac{\sqrt{3}r^2}{4}$

B = Area of the hexagon $= \frac{\sqrt{3}r^2}{4} \times 6 = \frac{3\sqrt{3}r^2}{2}$

$\Longrightarrow \frac{B}{A} = \frac{\frac{3\sqrt{3}r^2}{2}}{2r^2} = \frac{\frac{3\sqrt{3}}{2}}{2} = \frac{3\sqrt{3}}{4}$

S8. Ans.(d)

Sol.

$\frac{1(AE)}{1(EB)} = \frac{1(AC)}{1(CB)} \Longrightarrow \left(\frac{AE}{EB}\right)^2 = \frac{AC^2}{BC^2}$ ...(i)

Using similarly of triangle $BC^2 = BD \times BA$ and $AC^2 = AD \times BA$

$\frac{AC^2}{BC^2} = \frac{AD}{BD}$ ...(ii)

Using (i) and (ii)

So, $\left(\frac{AE}{EB}\right)^2 = \frac{AD}{BD}$ So, $AD = \frac{9}{4} \times 4 = 9$ cm

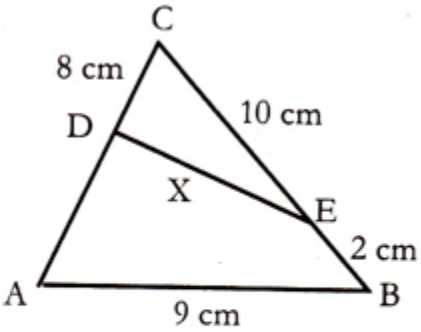
Using properties of similarity $CD^2 = DB \times DA = 4 \times 9$

CD = 6 cm.

S9. Ans.(b)

Sol. In triangles ABC and EDC, ∠A=∠CED and ∠C is common. So, they are similar.

Similarly,



$\frac{CA}{CE} = \frac{AB}{ED} = \frac{BC}{DC}$ i.e. $\frac{8+y}{10} = \frac{9}{x} = \frac{12}{8}$

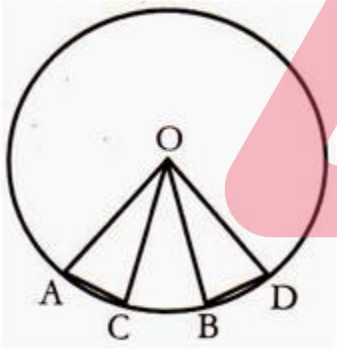
Solving we get x = 6 and y = 7

Hence the answer = 13.

S10. Ans.(d)

Sol.

$\angle AOC = \angle BOD = 40° - 15° = 25°$



Now $\angle AOD = 25° + 25° + 15° = 65°$

S11. Ans.(b)

Sol.

Average

$= \frac{5600 + 8000 + 6000}{20}$

$= \frac{19600}{20}$

= 980 Rs.

S12. Ans.(c)

Sol.

Average speed

$= \frac{2 \times 20 \times 30}{50}$

= 24 km/hr

S13. Ans.(a)

Sol.

Loss %

$= \frac{1250}{5750} \times 100$

$= 21.739$

$\cong 21.74\%$

S14. Ans.(b)

Sol.

$S.P = \frac{4}{3} C.P$

$C.P : S.P = 3 : 4$

$Profit\ \% = \frac{1}{3} \times 100$

$= 33\frac{1}{3}\%$

S15. Ans.(b)

Sol.

$Passed\ in\ Section\ I = 20 \times \frac{80}{100}$

$= 16$

$Passed\ in\ Section\ II = 30 \times \frac{60}{100}$

$= 18$

$Pass\ \% = \frac{16 + 18}{20 + 30} \times 100$

$= \frac{34}{50} \times 100$

$= 68\%$

S16. Ans.(c)

Sol.

Remaining Distance

$= 310 - 90 \times \frac{3}{2}$

$= 310 - 135$

$= 175$

Time taken to travel 175 km

$= \frac{175}{70} = 2.5$ hrs

Total time = 2.5 + 1

= 3.5 hrs

S17. Ans.(a)

Sol.

$252 = \frac{2100 \times r \times 2}{100}$

Rate = 6%

New Rate = 5%

$New\ Interest = \frac{2100 \times 5 \times 2}{100}$

= 210 Rs.

S18. Ans.(c)

Sol.

Let Number → x

20% decrease ⇒ $\frac{80x}{100}$

⇒ $\frac{4x}{5}$

20% Increase ⇒ $\frac{4x}{5} \times \frac{120}{100}$

⇒ $\frac{24x}{25}$

$\frac{24}{25}x = x - 20$

$20 = x - \frac{24x}{25}$

x = 20 × 25 = 500

S19. Ans.(d)

Sol.

$a^2 + b^2$

$= (a + b)^2 - 2ab$

$= (12)^2 - 2 \times 22$

$= 144 - 44$

$= 100$

S20. Ans.(d)

Sol.

$\frac{15 \times 7}{1/3} = 5 \times x$

x = 63 men

S21. Ans.(b)

Sol.

∠A + ∠B = 75°

∠B + ∠C = 140°

∠A + ∠B + ∠C = 180°

75 + ∠C = 180°

∠C = 105°

∠B + 105° = 140°

∠B = 35°

S22. Ans.(b)

Sol.

ΔABC ≅ ΔDEF

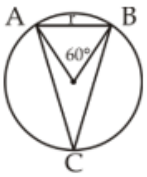
$\frac{\text{area of } \Delta ABC}{\text{area of } \Delta DEF} = \left(\frac{BC}{EF}\right)^2$

$\frac{9}{16} = \frac{2.1 \times 2.1}{EF^2}$

$EF = \frac{2.1 \times 4}{3}$

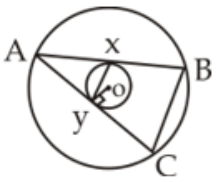
EF = 2.8 cm

S23. Ans.(d)
Sol.



AOB is an equilateral triangle
So,
$\angle AOB = 60°$
$\angle AOB = 2\angle ACB$
$60° = 2\angle ACB$
$\angle ACB = 30°$

S24. Ans.(b)
Sol.



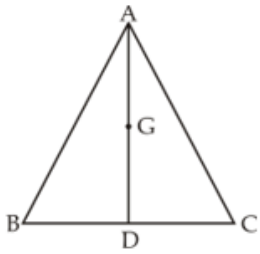
OY is $\perp AC$
$\therefore AY = YC$
$\Delta AY \times \cong OABC$

$$\frac{AY}{AC} = \frac{XY}{BC}$$

$$\frac{AY}{2AY} = \frac{XY}{BC}$$

$$XY = \frac{1}{2}BC$$

S25. Ans.(c)
Sol.



$$AB = \frac{24}{3} = 8cm$$

$$BD = \frac{8}{2} = 4$$

$$AD = \sqrt{64 - 16}$$

$$= \sqrt{48}$$

$$= 4\sqrt{3}$$

$AG : GD = 2 : 1$

$3r \rightarrow 4\sqrt{3}$

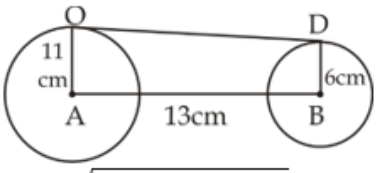
$$2r \rightarrow \frac{4\sqrt{3}}{3} \times 2$$

$$\Rightarrow \frac{8\sqrt{3}}{3}$$

$$= \frac{8}{\sqrt{3}} cm$$

S26. Ans.(d)

Sol.



$OD = \sqrt{(d)^2 - (r_1 - r_2)^2}$

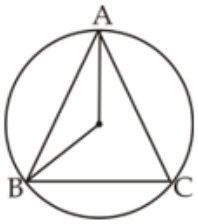
$= \sqrt{169 - 25}$

$= \sqrt{144}$

$= 12$ cm

S27. Ans.(b)

Sol.



$AC = 12\sqrt{3} = AC$

$BC = 24$

$\text{Radius of circle} = \frac{abc}{4 \times \text{area of } \Delta}$

$s = \frac{24\sqrt{5} + 24}{2}$

$= 12(\sqrt{5} + 1)$

$\text{Area} = \sqrt{12(\sqrt{5}+1) \times 12 \times 12 \times 12(\sqrt{5}-1)}$

$= \sqrt{12 \times 12 \times 12 \times 12 \times 4}$

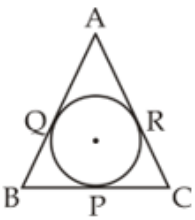
$= 144 \times 2 = 288$

$\text{Radius} = \frac{12\sqrt{5} \times 12\sqrt{5} \times 24}{4 \times 288}$

$= \frac{60}{4} = 15$ cm

S28. Ans.(a)

Sol.



$AB = AC$

$AQ + BQ = AR + RC$ ...(i)

$BQ = BP$ & $PC = RC$ ...(ii)

$AQ + PB = AR + PC$

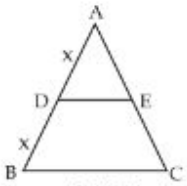
Also, $AQ = AR$

$AR + PB = AR + PC$

$PB = PC$

S29. Ans.(d)

Sol.



$$\frac{\text{Area } \Delta ADE}{\text{Area } \Delta ABC} = \left(\frac{x}{2x}\right)^2$$

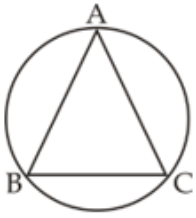
$$\frac{\text{area } \Delta ADE}{\text{area } \Delta ABC} = \frac{1}{4}$$

Area of BDEC = 4 – 1= 3

Δ ADE : BDEC = 1 : 3

S30. Ans.(d)

Sol.



Radius of circle

$$= \frac{abc}{4 \times \text{area of } \Delta ABC}$$

$$= \frac{17 \times 17 \times 6}{4\sqrt{20 \times 3 \times 3 \times 14}}$$

$$= \frac{17 \times 17 \times 6}{4 \times 3 \times 2\sqrt{70}}$$

= 8.6 cm