Q1. P and Q together can complete 3/5 of a work in 6 days, and Q alone can complete the remaining work in 8 days. In how many days can P alone complete the entire work?

(a) 10 days

(b) 20 days

(c) 12 days

(d) 15 days

Q2. The angle of elevation of a lamp post changes from 30° to 60° when a person walks 30 m towards it. Find the height of the lamp post.

(a) $15\sqrt{3}$m

(b) $\frac{15}{\sqrt{3}}$m

(c) $5\sqrt{3}$m

(d) $10\sqrt{3}$m

Q3. If (1 + tan A) (1 + tan B) = 2, then what will be the value of tan (A + B)?

(a) 0

(b) 2

(c) 1

(d) -1

Q4. The mean of scores obtained by 50 students is found to be 79.5. Later on, it was found that the score of one student was read as 94 in place of 49 and the score of another student was read as 69 in place of 89. Find the correct mean.

(a) 85.52
(b) 79.35
(c) 79
(d) 78

Q5. Two trains are moving in the opposite direction at the speed of 15 km/hr and 60 km/hr, whose lengths are 640 metres and 360 metres respectively. What is the time taken by slower train to cross the faster train?

(a) 36 sec
(b) 32 sec
(c) 40 sec
(d) 48 sec

Q6. If the total surface area of a cube is 864 m^2, then its volume is:

(a) 1728 m^3

(b) 1428 m^3

(c) 1228 m^3

(d) 1528 m^3

Q7. A sum of money becomes 7/4 of itself in 6 years at a certain rate of simple interest. Find the rate of interest.

(a) 12%
(b) 12.5%
(c) 8%
(d) 14%

Q8. The curved surface area of a cone is 2200 cm^2 and its radius is 28 cm , what is the slant height (in cm) of the cone? (Use $\pi = 22/7$)

(a) 21 cm

(b) 23 cm

(c) 29 cm

(d) 25 cm

Q9. Two horses were sold for Rs. 12,000 each, one at a loss of 20% and the other at a gain of 20%. The entire transaction resulted in

(a) no loss no gain
(b) loss of Rs. 1,000
(c) gain of Rs. 1,000
(d) None of these

Q10. Three times the present age of Renu is 11 years more than two times the present age of Manav, and three times the present age of Manav is 9 years less than four times the present age of Renu. The sum of the present ages (in years) of Renu and Manav is

(a) 35

(b) 33

(c) 34

(d) 32

Solutions:

S1. Ans. (b)

Sol. Given
P and Q together complete 3/5 of the work in 6 days.

Q alone completes the remaining work (1-3/5=2/5) in 8 days.
Work = Efficiency × Time.

$$\text{Efficiency} = \frac{\text{work}}{\text{Time}}$$

Now, we have
Total Efficiency of P and Q = Efficiency of P + Efficiency of Q.
Q completes 2/5 of the work in 8 days

$$\text{Efficiency of Q} = \frac{\text{Work}}{\text{Time}} = \frac{2/5}{8} = \frac{1}{20} \text{ work/day}$$

P and Q together complete 3/5 of the work in 6 days

$$\text{Combined Efficiency of P and Q} = \frac{\text{Work}}{\text{Time}} = \frac{3/5}{6} = \frac{1}{10} \text{ work/day}$$

Efficiency of P = Combined Efficiency of P and Q - Efficiency of Q

$$\text{Efficiency of P} = \frac{1}{10} - \frac{1}{20} = \frac{1}{20}$$

$$\text{Time} = \frac{\text{Total Work}}{\text{Efficiency Time taken by P}} = \frac{1}{1/20} = 20 \text{ days}$$

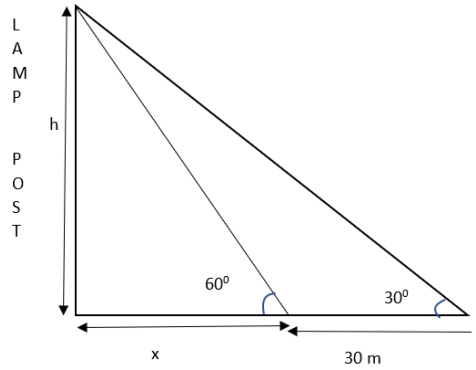
S2. Ans. (a)

Sol. Given:

Angle changes from 30° to 60°

Distance walked = 30 m.

Now,



$$\tan 60° = \frac{h}{x} \Rightarrow \sqrt{3} = \frac{h}{x}$$

$$\Rightarrow h = \sqrt{3}x \ldots\ldots\ldots (i)$$

$\tan 30° = \frac{h}{x+30} \Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{x+30}$

$x + 30 = h\sqrt{3}$

$x + 30 = \sqrt{3}x \times \sqrt{3}$

{Using (i)}

$x + 30 = 3x$

$2x = 30 \Rightarrow x = 15$

From (i), we get

$h = 15\sqrt{3}$m

S3. Ans. (c)

Sol. We have

(1 + tan A) (1 + tan B) = 2

$\Rightarrow 1 + \tan A + \tan B + \tan A \tan B = 2$

$\Rightarrow \tan A + \tan B + \tan A \tan B = 1$

$\Rightarrow \tan A + \tan B = 1 - \tan A \tan B$

$\Rightarrow \frac{\tan A + \tan B}{1 - \tan A \tan B} = 1$

$\Rightarrow \tan(A + B) = 1$

S4. Ans. (c)

Sol. Sum of marks obtained by 50 students = $50 \times 79.5 = 3975$

Correct sum =$3975 + 49 - 94 + 89 - 69 = 3950$

Correct mean = $\frac{3950}{50} = 79$

S5. Ans. (d)

Sol. Given:

Speed of train1 = 15 km/h

Speed of train2 = 60 km/h

Length of train1 = 640 m

Length of train2 = 360 m

Speed = Distance / Time

As the train is moving in the opposite direction,

=> Relative speed = Speed of train1 + speed of train2 = 15+ 60 = 75 km/hr

$75 \text{ km/hr} = 75 \times \frac{5}{18}$

The length of train is the distance he travelled to cross the train

$\Rightarrow$ Speed = Distance / Time

$\Rightarrow 75 \times \frac{5}{18} = \frac{640 + 360}{\text{Time}}$

Time $= 48$sec

S6. Ans. (a)

Sol. Given:

Total surface area of cube $= 864\ m^2$

We have

Total surface area of cube $= 6a^2$

$\Rightarrow 6a^2 = 864$

$\Rightarrow a^2 = 144$

$\Rightarrow a = 12\ m$

Now, volume of cube $= a^3 = (12)^3 = 1728\ m^3$

S7. Ans. (b)

Sol. Let x be a sum. Then,

$A = \frac{7}{4}x$

So,

$SI = \frac{3}{4}x$, $T = 6$ years, $R = ?$

$$R = \frac{SI \times 100}{P \times T} = \frac{\frac{3}{4}\text{x} \times 100}{x \times 6} = 12.5\%$$

S8. Ans. (d)

Sol. Given

C. S . A of cone $= 2200$ cm^2

Radius $= 28$ cm

We have

C.S.A of cone $= \pi$rl

πrl $= 2200$

$$\frac{22}{7} \times 28 \times l = 2200$$

$$l = \frac{(2200 \times 7)}{(22 \times 28)}$$

l $= 25$ cm

S9. Ans. (b)
Sol. Since the first horse was sold at a 20% loss, the cost price (CP_1) is given by:
SP=CP−20% of CP
$12{,}000 = 0.8 \times CP_1$
$12000 = 0.8 \times CP_1$
$CP_1 = 15000$
Since the second horse was sold at a 20% gain, the cost price (CP_2) is given by:
SP=CP+20% of CP
$12000 = 1.2 \times CP_2$
$CP_2 = 10000$
Total cost price = 15000 + 10000 = 25000
Total selling price = 12000 + 12000 = 24000
Loss = Total cost price – Total selling price = 1000
So, the entire transaction resulted in a loss of Rs. 1,000.
S10. Ans. (d)

Sol. Given:
Let Renu Age = R & Manav Age = M

$3R = 2M + 11$ ... . (i)
$3M = 4R - 9$ ... ... (ii)

From (i), we get

$$R = \frac{2M + 11}{3}$$

Substituting values in R into (ii)

$$3M = 4\left(\frac{2M + 11}{3}\right) - 9$$
$$3M = \frac{8M + 44}{3} - 9$$
$$9M = 8M + 44 - 27$$
$$\Rightarrow M = 17$$

Now,

$$R = \frac{2(17) + 11}{3} = \frac{45}{3} = 15$$

Thus, the sum of age of Renu and Manav
$R + M = 15 + 17 = 32$ years