Q1. A 50 litres mixture of water and acid contains 20% acid. How much acid should be added to make the acid 60% in the new mixture?

(a) 25 liters

(b) 30 liters

(c) 45 liters

(d) 50 liters

Q2. The two whole numbers are such that the cube of the first number exceeds the cube of the second by 61 and the ratio of the numbers is 5:4. What is the value of a larger number?

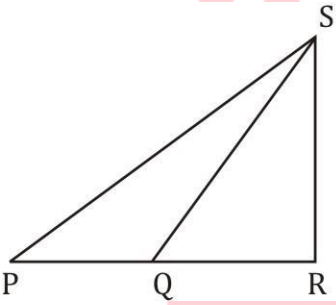
(a) 3

(b) 4

(c) 5

(d) 6

Q3. In the given figure above PQ = QS and QR = RS If ∠ SRQ = 100°, then ∠ QPS is equal to



(a) 40°

(b) 30°

(c) 20°

(d) 15°

Q4. What is the initial cost of toy (in Rs) which is passed through, producer, whole seller and shopkeeper and each seller has gained 25% and finally sold for Rs. 500?

(a) 256

(b) 125

(c) 120

(d) 128

Q5. The height of the equilateral triangle is 9 cm. What is the radius (in cm) of the circle circumscribing the three vertices?

(a) 3

(b) 6

(c) 9

(d) 12

Q6. The incomes of P and Q are in the ratio 4 : 7 and their expenditures are in the ratio 3 : 7. If P saves Rs 10000 and Q saves Rs 7000, then what will be the income (in Rs) of P?

(a) 28000

(b) 23000

(c) 30000

(d) 19000

Q7. Simplify:

(157 × 157 + 143 × 143).

(a) 45098

(b) 46098

(c) 90196

(d) 91196

Q8. Find the value of '?' in $5^{12} \times 125 \div 15625 = 3125 \times 25^{?}$.

(a) 4

(b) 3

(c) 2

(d) 1

Q9. Shaan got a total of Rs. 912 in the denomination of equal numbers of Rs. 1, Rs. 5 and Rs. 10 coins. How many coins do Shaan posses?

(a) 16

(b) 57

(c) 171

(d) 323

Q10. A train moves at a speed of 35 m/sec and crosses a tunnel of length 960 metres, in 40 seconds. What is the length (in metres) of the train?

(a) 360

(b) 440

(c) 530

(d) 560

Q11. Simple interest on a sum for six months at 5% per annum is Rs 65.5. What is the value (in Rs) of sum?

(a) 2600

(b) 2620

(c) 1320

(d) 2880

Q12. Divide 150 into two parts such that the sum of their reciprocals is 15/560. Calculate both the parts.

(a) 50, 90

(b) 70, 80

(c) 60, 90

(d) 50, 100

Q13. The ratio of salary of u, v and w is 8 : 7 : 13. If we gets Rs990 more than that of v, then what is the salary (in Rs) of u?

(a) 1320

(b) 2165

(c) 3215

(d) 1565

Q14. Two whole numbers are such that the square of first number exceeds the second by 112 and the ratio of the numbers is 4:3. What is the value of smaller number?

(a) 3

(b) 4

(c) 12

(d) 36

Q15. In an isosceles triangle ABC, the sum of similar angles of the triangles is half of the third angle of the triangles. Then find the angles?

(a) 45°, 45°, 90°

(b) 30°, 30°, 120°

(c) 20°, 20°, 140°

(d) none of these

Q16. If $(6x^2 – 22x + p)$ and $(4x^2 – 15x + q)$ both are divisible by $(x – 3)$ the which of the following is true relationship between p and q

(a) p – q = 2

(b) p + q = 72

(c) $\frac{p}{q} = \frac{3}{4}$

(d) None of these

Q17. If $1 + Sin^2A = 3SinA\ cosA$, Find the value of tanA

(a) –1, $\frac{-1}{2}$

(b) 1, $\frac{-1}{2}$

(c) 1, $\frac{1}{2}$

(d) 1, 2

Q18. If $\frac{2sinsin\ A}{1+CosA+SinA} = K$, what is the value of $\frac{(1-cosA+sinA)}{1+SinA}$?

(a) K

(b) $\frac{K}{2}$

(c) 2K

(d) K^2

Q19. A sum becomes its double in 10 years find the annual rate of simple interest.

(a) 8%

(b) 5%

(c) 10%

(d) 20%

Q20. What is the area of the given rectangle?

I. Perimeter of the rectangle is 60 cm

II. Breadth of the rectangle is 12 cm

III. Sum of two adjacent side is 30 cm

Which of the following statement is/are required for solving the given question?

(a) I + II both

(b) II + III both

(c) III + I both

(d) both a and b

Q21 The value of $sin\ sin\ \left(67\frac{1}{2}\right)^\circ$ $sin\ sin\ \left(22\frac{1}{2}\right)^\circ$ is equal to

(a) $-2\sqrt{2}$

(b) $2\sqrt{2}$

(c) $\frac{1}{2\sqrt{2}}$

(d) $\frac{-1}{2\sqrt{2}}$

Q22. $\frac{1}{33}$ of $\frac{1}{66}$ of $\frac{1}{3}$ of $\frac{1}{66}$ of 1000 of a number will be what percentage of that number?

(a) 2.32

(b) 1.32

(c) 0.232

(d) 0.0232

Q23. What is value of $(6x^2 - 5y^2)(6x^2 + 5y^2)$, if x = $\frac{1}{\sqrt{3}}$ and y = $\frac{1}{\sqrt{5}}$?

(a) 2

(b) 3

(c) 4

(d) 5

Q24. If a ⊗ b = (a + b)(a× b), then find the value of 6 ⊗ 5.

(a) 110

(b) 220

(c) 330

(d) 440

Q25. Angles of the triangle are in the ratio of 1:2:3. Choose the correct triangle for the given ratio.

(a) Equilateral

(b) Isosceles

(c) Right angle

(d) Obtuse angled

Q26. If the diameter of the two circles is 6 units and 10 units and a centre distance of 8 units. Calculate the number of common tangents that can be drawn to both the circle.

(a) 2

(b) 3

(c) 4

(d) Infinite

Q27. If cos 240° = x, then value of x is

(a) $-1/\sqrt{2}$

(b) $-\sqrt{3}/2$

(c) -½

(d) 1/2

Q28. Three hours after a goods train passed a station, another train travelling at a speed of 88 km/hr following that goods train passed through that station. If after passing the station the train overtakes the goods train in 8 hours. What is the speed of the goods train?

(a) 76.8 km/hr

(b) 64 km/hr

(c) 96 km/hr

(d) 51.2 km/hr

Q29. If a + b = 9 and a2 + b2 = 61, then ab is

(a) 20

(b) 10

(c) 81

(d) 142

Q30. Reflection of the point (2,5) in the x-axis is

(a) (2,5)

(b) (2,-5)

(c) (-2,5)

(d) (-2,-5)

Solutions

S1. Ans.(d)

Sol. 50 liters mixture = 20% acid

⇒ 10 liters acid 40 liters water

New mixture = 60% of acid

Let y be the mixture = 100 liters

Acid 60% = 60 liters

So, 50 liters acid should be added to make the acid 60% in the new mixture.

S2. Ans.(c)

Sol. $(5x)^3 - (4x)^3 = 61$

$125x^3 - 64x^3 = 61$

$x = 1$

5, 4 are numbers

S3. Ans.(c)

Sol.

PQ = QS

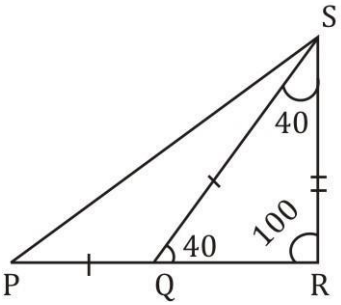
QR = RS

⇒ ∠RQS = ∠QSR

$= \frac{180° - 100°}{2} = 40°$

∠PQS = 180° – 40° = 140°

$\angle QPS = \frac{180° - 140°}{2} = 20°$



S4. Ans.(a)

Sol. $x \times \frac{5}{4} \times \frac{5}{4} \times \frac{5}{4} = 500$

x = 256 Rs.

S5. Ans.(b)

Sol.

As we know ratio between height and circum-radius of a equilateral triangle is 3 : 2

Then required circum-radius $= \frac{9}{3} \times 2 = 6$ cm

S6. Ans.(a)

Sol. $\frac{4x-10000}{7x-7000} = \frac{3}{7}$

28x – 70000 = 21x – 21000

7x = 49000

X = 7000 Rs.

Income of P = 7000 × 4 = Rs. 28000

S7. Ans.(a)

Sol. $((150 + 7)^2 + (150 - 7)^2)$

$150^2 + 7^2 + 2 \times 150 \times 7 + 150^2 + 7^2 - 2 \times 7 \times 150 = 2\ (150^2 + 7^2)$

= 2 (22500 + 49) = 2 (22549) = 45098

S8. Ans.(c)

Sol. $\frac{5^{12} \times 125}{15625} = 3125 \times 25^x$

$\frac{5^{12} \times 5^3}{5^6 \times 5^5} = 5^{2x}$

$5^4 = 5^{2x}$

x = 2

S9. Ans.(c)

Sol. 1x + 5x + 10x = 912

16x = 912

x = 57

Total coins = 57 × 3 = 171

S10. Ans.(b)

Sol. 35 × 40 = 960 + x

1400 = 960 + x

x = 440m

S11. Ans.(b)

Sol.

Let sum = x

ATQ,

$$\frac{x \times 5 \times 6}{100 \times 12} = 65.5$$

x = 2620

S12. Ans.(b)

Sol. $\frac{1}{70} + \frac{1}{80} = \frac{15}{560}$

S13. Ans.(a)

Sol. 13x – 7x = 990

6x = 990

x = 165 Rs.

Salary of U = 8 × 165 = 1320 Rs.

S14. Ans.(c)

Sol. 4x, 3x be the number

$16x^2 – 9x^2 = 112$

$7x^2 = 112$

$x = 4$

Number = 16, 12

S15. Ans.(b)

Sol.

Let the similar angles be x

ATQ,

$2x = \frac{1}{2}y$

$y = 4x$

$4x + 2x = 180°$

$x = 30°$

$\Rightarrow$ angles = 30°, 30°, 120°

S16. Ans.(d)

Sol.

X=3, must satisfy the give equation

ATQ,

$6 \times 3^2 - 22 \times 3 + p = 0$

$54 - 66 + p = 0$

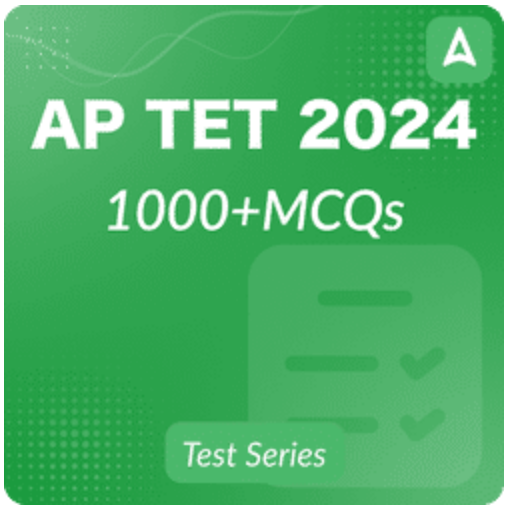
$p = 12$

$4 \times 3^2 - 15 \times 3 + q = 0$

$36 - 45 + q = 0$

$q = 9$

$\frac{p}{q} = \frac{4}{3}$



S17. Ans.(c)

Sol. $\sin^2A + \cos^2A = 3\sin A \cos A$

$\sec^2A + \tan^2A = 3\tan A$

$2\tan^2A - 3\tan A + 1 = 0$

$\tan A = \frac{3 \pm \sqrt{9-8}}{4}$

$= \frac{3 \pm 1}{4}$

$\Rightarrow \tan A = 1, \frac{1}{2}$

S18. Ans.(a)

Sol. $\frac{1-CosA+SinA}{1+SinA} = \left(\frac{1-cosA+sinA}{1+SinA}\right)\left(\frac{1+cosA+sinA}{1+cosA+sinA}\right)$

$= ((1 + \sin A)^2 - \cos^2A)/ (1 + \sin A) (1 + \cos A + \sin A)$

$= ((1 + \sin A)^2 - (1 - \sin^2A))/(1 + \sin A) (1 + \cos A + \sin A)$

$= \frac{2\ sinA}{1+Cos\ A+SinA} = K$

S19. Ans.(c)

Sol. $x = \frac{x\ R\ 10}{100}$

R = 10%

S20. Ans.(d)

Sol. 12 + x = 30

x = 18

Area = 18 × 12

Similarly 2 (x + 12) = 60

x = 18

Area = 12 × 18

S21. Ans.(c)

Sol. We know,

$$sin\ sin\ \left(67\frac{1}{2}\right)^{\circ} = Cos\left(22\frac{1}{2}\right)^{\circ}$$

ATQ,

$cos\ cos\ \left(22\frac{1}{2}\right)^{\circ}\ sin\ sin\ \left(22\frac{1}{2}\right)^{\circ} = \frac{1}{2}$ sin 45

$= \frac{1}{2\sqrt{2}}$

S22. Ans.(a)

Sol.

Let number be x

$$\frac{1}{33} of \frac{1}{66} of \frac{1}{3}\ of \frac{1}{66} of\ 1000\ of\ x$$

$$\Rightarrow x \times 1000 \times \frac{1}{33} \times \frac{1}{66} \times \frac{1}{3} \times \frac{1}{66}$$

Required % $= \frac{x \times 10000 \times \frac{1}{33} \times \frac{1}{66} \times \frac{1}{3} \times \frac{1}{66}}{x} \times 100$

$$= \frac{10000 \times 100}{33 \times 66 \times 3 \times 66}$$

= 2.318 ~ 2.32%

S23. Ans.(b)

Sol.

(6x² - 5y²) (6x² + 5y²), if $x = \frac{1}{\sqrt{3}}\ and\ y = \frac{1}{\sqrt{5}}$?

w.k.t

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

So,

$$(6x^2 - 5y^2)(6x^2 + 5y^2)$$

$= 36x^4 - 25y^4$

By putting the value of x and y

$$36 \times \frac{1}{9} - 25 \times \frac{1}{25} = 4 - 1$$

=3

S24. Ans.(c)

Sol.

a ⊗ b = (a+b)(a ×b)

so,

6 ⊗ 5 = (6 + 5) (6 × 5)

= 11 × 30

= 330

S25. Ans.(c)

Sol.

Let angles be x, 2x and 3x

w.k.t

x + 2x + 3x = 180

6x = 180

x = 30

Angles are → 30°, 60° and 90°

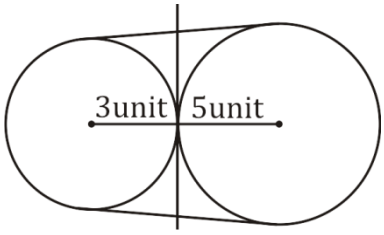
One angle of triangle is 90°,

So,

Triangle is right angled triangle.

S26. Ans.(b)

Sol.



Possible common tangents are 3

S27. Ans.(c)

Sol.

x = cos(240°) = cos (180° + 60°)

= – cos60°

$= -\frac{1}{2}$

S28. Ans.(b)

Sol.

Distance travelled by goods train in 11 hours is equal to the distance travelled by other train in 8 hours.

ATQ,

11 × x = 8 × 88

X = 64 km/hr

S29. Ans.(b)

Sol.

(a + b) = 9

$a^2 + b^2 + 2ab = 81$

$$ab = \frac{81 - 61}{2} = 10$$

S30. Ans.(b)

Sol.