SOLUTIONS

1. **(b)** $\frac{33}{2}$

Explanation:

$g = t^{\frac{2}{3}} + 4t^{\frac{-1}{2}}$

$= t^{\frac{2}{3}} + 4 \times \frac{1}{t^{\frac{1}{2}}}$

$= (64)^{\frac{2}{3}} + 4 \times \frac{1}{64^{\frac{1}{2}}}$

$= \left(4^3\right)^{\frac{2}{3}} + 4 \times \frac{1}{(8^2)^{\frac{1}{2}}}$

$= 4^{\frac{2}{3} \times 3} + 4 \times \frac{1}{8^{2 \times \frac{1}{2}}}$

$= 4^2 + \frac{4}{8}$

$= 16 + \frac{1}{2}$

$= \frac{33}{2}$

2. **(a)** 2x – y = 12

Explanation:

x = 5 and y = -2 is the solution of the linear equation 2x – y = 12

2x - y = 12

LHS = 2x - y

2.5 - (-2)

10 + 2

12

RHS = 12

LHS = RHS

It means that x = 5 and y = -2 is the solution of the linear equation 2x - y = 12.

3. **(a)** (-, +)

4. **(d)** 2

Explanation:

Adjusted frequency = $\left(\frac{\text{frequency of the class}}{\text{width of the class}}\right) \times 5$

Therefore, Adjusted frequency of 25 - 45 = $\frac{8}{20} \times 5 = 2$

5. **(a)** infinitely many solutions

Explanation:

Given linear equation: 3x - 5y = 15 Or, $x = \frac{5y+15}{3}$

When y = 0, $x = \frac{15}{3} = 5$

When y = 3, $x = \frac{30}{3} = 10$

When y = -3, $x = \frac{0}{3} = 0$

6. **(a)**

A straight line may be drawn from any one point to any other point.

Explanation: A straight line may be drawn from any one point to any other point.

7. **(b)** 105°

Explanation:

Given that,

l ∥ m and n cuts them

Let,

$\angle 1 = 65^{o}$

$\angle 2 = x$

$\angle 3 = 40^{o}$

$\angle 1 = \angle 4 = 65^{o}$ (Alternate angle) (i)

$\angle 3 + \angle 4 + \angle 5 = 180^{o}$ (Angle sum property)

$40^{o} + 65^{o} + \angle 5 = 180^{o}$

$\angle 5 = 75^{o}$

Now,

$\angle 2 + \angle 5 = 180^{o}$ (Linear pair)

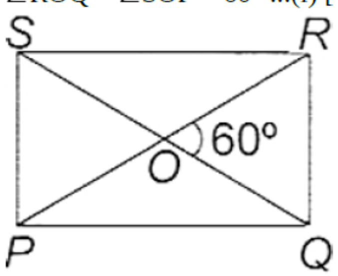
$x + 75^{o} = 180^{o}$

$x = 105^{o}$

8. **(a)** 60°

Explanation:

$\angle ROQ = \angle SOP = 60°$ ...(i) [Vertically opposite angles]



$\therefore$ PR = SQ $\Rightarrow$ PO= SO (Diagonals of a rectangle are equal and bisect each other)

$\Rightarrow \angle OPS = \angle OSP$ ...(ii) [$\because$ In a triangle, angles opposite to equal sides are equal]

In $\triangle POS$, by angle sum property

$\angle OSP + \angle OPS + \angle SOP = 180°$

$\Rightarrow 2\angle OSP = 180° - 60°$ [Using (i) & (ii)]

$\Rightarrow \angle OSP = 60°$

9. **(c)** $(x - y)^2(x + y)$

Explanation:

The given expression to be factorized is $x^3 - x^2y - xy^2 + y^3$

Take common x^2 from the first two terms and $-y^2$ from the last two terms. That is

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

Finally, take common $(x - y)$ from the two terms. That is

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

$= (x - y)\{(x^2 - y^2)\}$

$= (x - y)(x + y(x - y)$

$= (x - y)^2(x + y)$

10. **(d)** (3,0)

Explanation:

$2x + 3y = 6$ meets the X-axis.

Put $y = 0$,

$2x + 3(0) = 6$

$x = 3$

Therefore, graph of the given line meets X-axis at (3, 0).

11. **(d)** 90°

Explanation:

As AD is the perpendicular bisector of BC, so $\angle ADC = \angle ADB = 90^o$

12. **(c)** 10 cm

Explanation:

Let us assume a rhombus ABCD where,

$AB = BC = CD = DA$

Now, in triangle OBC by using Pythagoras theorem we get:

$BC^2 = OB^2 + OC^2$

$BC^2 = 6^2 + 8^2$

$BC^2 = 36 + 64$

$BC^2 = 100$

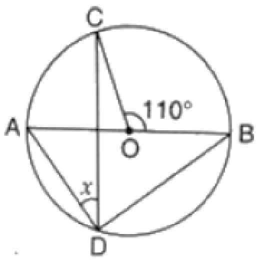
$BC = \sqrt{100}$

$BC = 10$ cm

$\therefore AB = BC = CD = DA = 10$ cm

13. **(b)** 30°

Explanation:



$\angle CDB = \frac{110^0}{2} = 55^0$

Now, $\angle ADB = 90^0$ (Angle in a semicircle)

So, $\angle ADC = x = 90^0 - 55^0 = 35^0$

14. **(b)** 2

Explanation:

$\sqrt[3]{2} \cdot \sqrt[4]{2} \cdot \sqrt[12]{32}$

$= \sqrt[3]{2} \cdot \sqrt[4]{2} \cdot \sqrt[12]{(2)^5}$

$= (2)^{\frac{1}{3}} \cdot (2)^{\frac{1}{4}} \cdot (2)^{\frac{5}{12}}$

$= (2)^{\frac{1}{3}+\frac{1}{4}+\frac{5}{12}}$

$= (2)^{\frac{4+3+5}{12}}$

$= (2)^{\frac{12}{12}}$

$= 2$

15. **(c)** 5

Explanation:

Distance between the graph of the equations x = -3 and x = 2 is = 2 – (-3) = 5 units

16. **(d)** BC = EF

Explanation:

In ΔABC and ΔDEF

$\angle B = \angle E$ and $\angle C = \angle F$

For congruence, BC = EF

Therefore by AAS axiom

$\Delta ABC \cong \Delta DEF$

17. **(c)** -224

Explanation:

Using, $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$

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

$\Rightarrow a^3 - b^3 = (-8)^3 + 3(-12)(-8)$

$\Rightarrow a^3 - b^3 = -512 + 288 = -224$

18. **(a)** 2400 cm^2

Explanation:

TSA of cube = $6a^2$

= $6 \times (20)^2$

= 6×400

= 2400 cm^2

19. **(c)** A is true but R is false.

Explanation:

s = $\frac{a+b+c}{2}$

s = $\frac{3+4+5}{2}$ = 6 cm

Area = $\sqrt{s(s-a)(s-b)(s-c)}$

= $\sqrt{(6)(6-3)(6-4)(6-5)}$

= $\sqrt{(6)(3)(2)(1)}$ = 6 cm^2

20.

(c) A is true but R is false.

Explanation:

($\frac{-3}{2}$, k) is a solution of 2x + 3 = 0

$2 \times \left(-\frac{3}{2}\right) + 3$ = -3 + 3 = 0

($\frac{-3}{2}$, k) is the solution of 2x + 3 = 0 for all values of k.

Also ax + b = 0 can be expressed as a linear equation in two variables as ax + 0·y + b = 0.