

NAME JALAL KHAN

ID 14885

PAPER BUSINESS MATHS

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Q1

(1)

(E)

(2)

(B)

(3)

(B)

(4)

(E)

(5)

(C)

(6)

(E)

(7)

(E)

(8)

(E)

(9)

(E)

(10)

(B)

Q.2A

(2)

(2)

sol: Age of Son = x Age of father = y

According to first condition

$$4x = y \Rightarrow 4x - y = 0 \rightarrow \text{eq (1)}$$

According to 2nd condition

$$2(x+24) = y+24$$

$$\Rightarrow 2x + 48 = y + 24$$

$$\Rightarrow 2x - y = 24 - 48$$

$$2x - y = 24 \rightarrow \text{eq (2)}$$

Now subtracting equation (2) from (1)

$$4x - y = 0$$

$$2x - y = -24$$

$$\begin{array}{r} - \quad + \quad - \quad + \\ \hline 2x \quad = 24 \end{array}$$

$$2x = 24$$

$$\Rightarrow x = \frac{24}{2} = 12 \Rightarrow x = 12$$

Now find out y we will put value of the eq (1)

$$4(12) - y = 0$$

$$48 - y = 0 \Rightarrow y = 48$$

Q2(b)

(2)

$$x + 3y = -1/3$$

$$4x - 1/5y = 2/2$$

Let

$$x + 3y = -1/3 \rightarrow \text{eqn (1)}$$

$$4x - 1/5y = 2/2 \rightarrow \text{eqn (2)}$$

Now multiply eqn (1) by 4 then subtract 2 from 1

$$4x + 12y = -4/3$$

$$- 4x - 1/5y = -2/2$$

$$12y + 1/5y = -4/3 - 1$$

$$\frac{60y + 1y}{5} = \frac{-4-3}{3}$$

$$\frac{61y}{5} = \frac{-7}{3}$$

$$61y = \frac{-7 \times 5}{3}$$

$$61y = \frac{-35}{3}$$

$$\Rightarrow y = \frac{-35}{61 \times 3}$$

$$y = \frac{-35}{183}$$

Now putting value of y in eq(2)

(4)

$$4x - 118 \left(\frac{-35}{183} \right) = \frac{2}{2}$$

$$4x + \frac{7}{183} = 1$$

$$\Rightarrow 4x = 1 - \frac{7}{183}$$

$$4x = \frac{183 - 7}{183}$$

$$4x = \frac{176}{183}$$

$$\Rightarrow x = \frac{176 \cancel{44}}{183 \times 4}$$

$$\boxed{x = \frac{44}{183}}$$

Now

$$\boxed{x = \frac{44}{183}, y = \frac{-35}{183}}$$

Q3A)

$$\frac{x^{-3}}{x^{-3/2}} + \frac{x}{x^{3/4} y^{-2}} \times \frac{x^2 y^{-3}}{y^{1/3}} \quad (5)$$

Sol:

$$= \frac{x^{-3}}{x^{-3/2}} + \frac{x^1 \cdot x^2 y^{-3}}{x^{3/4} \cdot y^{-2} \cdot y^{1/3}}$$

$$= \frac{x^{-3}}{x^{-3/2}} + x^{3-\frac{3}{4}} \cdot y^{-3+2-\frac{1}{3}}$$

$$= x^{-3} \cdot x^{+3/2} + x^{\frac{12-3}{4}} \cdot y^{-4/3}$$

$$= x^{\frac{-6+3}{2}} + x^{9/4} y^{-4/3}$$

$$= \boxed{x^{-3/2} + \frac{x^{9/4}}{y^{4/3}}}$$

(6)

Q3B) find The value of x by using logarithm laws

$$x^3 = \frac{7^3 \times (0.4500)^2}{0.0004 \times (0.0205)^4}$$

Solution

$$x^3 = \frac{7 \times 7 \times 7 (0.4500 \times 0.4500)}{0.0004 (0.0205)^4}$$

$$x^3 = \frac{69.4575}{7.0644 \times 10^{11}}$$

$$x^3 = 69.457 \times 7.0644 \times 10^{11}$$

$$x^3 = \frac{7 \times 7 \times 7 (0.4500 \times 0.4500)}{0.0004 (0.0205)^4}$$

$$x^3 = \frac{69.4575}{7.0644 \times 10^{11}}$$

$$x^3 = 69.457 \times 7.0644 \times 10^{11}$$

$$(x^3)^{1/3} = (69.457 \times 7.0644 \times 10^{11})^{1/3}$$

$$\boxed{x = 9943.67}$$

(7)

Q4)

A)

$$U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22\}$$

$$A = \{4, 8, 12, 16\}$$

$$B = \{4, 8, 12\}$$

$$C = \{2, 4, 6, 8, 10, 12, 14, 16, 18\}$$

Show that

$$a. (A \cup B)^c = A^c \cap B^c$$

$$b. A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

$$(A \cup B)^c = A^c \cap B^c$$

$$A \cup B = \{4, 8, 12, 16\} \cup \{4, 8, 12\}$$

$$A \cup B = \{4, 8, 12, 16\}$$

$$(A \cup B)^c = U \setminus A \cup B = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22\} \setminus \{4, 8, 12, 16\}$$

$$(A \cup B)^c = \{2, 6, 10, 14, 18, 20, 22\}$$

$$A^c = U \setminus A = \{2, 4, 6, 8, 10, 12, 14, 18, 20, 22\} \setminus \{4, 8, 12, 16\}$$

$$A^c = \{2, 6, 10, 14, 18, 20, 22\}$$

$$B' = U \setminus B = \{ 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 \}$$

$$B' = \{ 2, 6, 10, 14, 18, 20, 22 \} \cup \{ 4, 8, 12 \}$$

$$A \cup B' = \{ 2, 6, 10, 14, 18, 20, 22 \} \cup \{ 2, 6, 10, 14, 16, 18, 20, 22 \}$$

$$A \cup B' = \{ 2, 6, 10, 14, 18, 20, 22 \}$$

b) _____ x _____ x

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

$$A \cap C (B \cup C)$$

$$B \cup C = \{ 4, 8, 12 \} \cup \{ 2, 4, 6, 8, 10, 12, 14, 16, 18 \}$$

$$B \cup C = \{ 2, 4, 6, 8, 10, 12, 14, 16, 18 \}$$

$$A \cap (B \cup C) = \{ 4, 8, 12, 16 \} \cap \{ 2, 4, 6, 8, 10, 12, 14, 16, 18 \}$$

$$A \cap (B \cup C) = \{ 4, 8, 12, 16 \}$$

$$(A \cap B) \cup (A \cap C) = ?$$

$$A = \{ 4, 8, 12, 16 \}, B = \{ 4, 8, 12 \}$$

$$A \cap B = \{ 4, 8, 12, 16 \} \cap \{ 4, 8, 12 \}$$

$$A \cap B = \{ 4, 8, 12 \} \rightarrow \textcircled{1}$$

$$A \cap C = \{ 4, 8, 12, 16 \} \cap \{ 2, 4, 6, 8, 10, 12, 14, 16, 18 \}$$

$$A \cap C = \{4, 8, 12, 16\} \rightarrow \textcircled{2}$$

ex (1) and ex (2)

$$(A \cap B) \cup (A \cap C) = \{4, 8, 12\} \cup \{4, 8, 12, 16\}$$

$$(A \cap B) \cup (A \cap C) = \{4, 8, 12, 16\}$$

Therefore

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

Q5A

List price = \$150

Trade discount = 20% find the net cost = ?

Sol:

List price - discount

$$\text{Net cost} = 150 - 0.2(150)$$

$$\text{Net cost} = 150 - 30$$

$$\boxed{\text{Net cost} = \$120}$$

x ————— x
 (B) cost price = \$10

Markup = \$6.20

find markup percent on cost also find selling price.

Sol:

$$\text{Markup} = \text{S.P} - \text{cost}$$

$$\$6.20 = \text{S.P} - \$10$$

$$\Rightarrow \$6.20 + \$10 = \text{S.P}$$

$$\boxed{\$16.20 = \text{S.P}}$$

$$\% \text{ M-up} = \frac{\text{m-up}}{\text{cost}} \times 100$$

$$\% \text{ m-up} = \frac{16.20}{10} \times 100$$

$$\% \text{ m-up} = 162\%$$