

QUESTIUON 1 Given the following numbers:

$$-1, 0, 0.\bar{3}, 2.36366366636\dots, \pi, e, 57, 5, 9, -\frac{2}{7}, 0.8574, \sqrt{4}$$

Complete the following:

- a) INTEGERS: $-1, 0, 57, 5, 9, \sqrt{4}$
- b) RATIONAL NUMBERS: $-1, 0, 0.\bar{3}, 57, 5, 9, -\frac{2}{7}, 0.8574, \sqrt{4}$
- c) IRRATIONAL NUMBERS: $2.36366366636\dots, \pi, e,$
- d) PRIME NUMBERS: $5, \sqrt{4}$
- e) COMPOSITE NUMBERS: $57, 9$
- f) PERFECT SQUARE NUMBERS: $0, 9$

QUESTION 2. Which of the following is TRUE:

- a) $\pi = \frac{22}{7}$ (FALSE)
- b) Composite numbers are closed under the operation of addition (FALSE: $9+4=13$)
- c) Irrational numbers are closed under the operation of addition (FALSE: $\pi + (-\pi) = 0$)
- d) if $a-b = 4$, then $b-a = 4$ (FALSE)
- e) Prime and composite numbers are both positive integers and greater than 1. (TRUE)
- f) $-\pi$ is the reciprocal of $\frac{1}{\pi}$ (FALSE)
- g) If $-5 < x < -1$ then $|x - |-4x|| = 3x$ (FALSE: ANS= $-5x$)

QUESTION 3 If

$$A = \{y \mid y = x - |x|, \text{ where } x \text{ is an integer and } -2 \leq x < 3\}$$

, then list all elements of A . ANS = $A = \{-4, -2, 0\}$

QUESTION 4. SIMPLIFY

$$\frac{1 - \frac{1}{2}}{\frac{1}{2} - \frac{1}{3}} = \frac{\frac{2-1}{2}}{\frac{3-2}{6}} = \frac{\frac{1}{2}}{\frac{1}{6}} = \frac{1}{2} \cdot \frac{6}{1} = \frac{6}{2} = 3$$

QUESTION 5 Write the expression without the absolute value notation.

$$\frac{|x+2|}{x+2}, x < -2$$
$$ANS = \frac{-(x+2)}{(x+2)} = -1$$

QUESTION 6 Find the exact value of

$$\sqrt{(-8)^2} + \left(-\frac{1}{32}\right)^{-\frac{3}{5}}$$
$$Ans := |-8| + \left(-\frac{32}{1}\right)^{\frac{3}{5}} = 8 + [(-32)^{\frac{1}{5}}]^3 = 8 + [-2]^3 = 0$$

QUESTION 7 Simplify then combine like radicals

$$3x\sqrt[3]{8x^3y^4} - 2y\sqrt[3]{27x^6y}$$
$$= 3x\sqrt[3]{2^3x^3y^3y} - 2y\sqrt[3]{3^3(x^2)^3y}$$
$$= 6x^2y\sqrt[3]{y} - 6x^2y\sqrt[3]{y} = 0$$

QUESTION 8 Rationalize the denominator of

$$\frac{1}{\sqrt[3]{24}} - \frac{4}{\sqrt[3]{3}} - \frac{2}{\sqrt[3]{81}}$$

$$\begin{aligned} & \frac{1}{\sqrt[3]{2^3 \cdot 3}} - \frac{4}{\sqrt[3]{3}} - \frac{2}{\sqrt[3]{3^3 \cdot 3}} \\ &= \frac{1}{2\sqrt[3]{3}} - \frac{4}{\sqrt[3]{3}} - \frac{2}{3\sqrt[3]{3}} = \frac{3 - 24 - 4}{6\sqrt[3]{3}} = \frac{-25 \cdot \sqrt[3]{3^2}}{6\sqrt[3]{3} \cdot \sqrt[3]{3^2}} = \frac{-25\sqrt[3]{9}}{18} \end{aligned}$$

$$A = \{x | x \leq -1\} \cup \{x | x \geq 2\}$$

QUESTION 9

$$B = \{x | -1 \leq x \leq 3\} \cap \{x | 1 < x < 5\}$$

Find $A \cap B$, then graph A and B

QUESTION 10 Simplify the expression

$$\frac{2^{\frac{5}{2}} x^{\frac{5}{6}} y^{\frac{1}{5}}}{4x^{\frac{1}{3}} y^{\frac{7}{10}}} = 2^{\frac{5}{2}-2} x^{\frac{5}{6}-\frac{1}{3}} y^{\frac{1}{5}-\frac{7}{10}} = 2^{\frac{1}{2}} x^{\frac{1}{2}} y^{\frac{-1}{2}} = \sqrt{\frac{2x}{y}} = \frac{\sqrt{2xy}}{y}$$