

PRACTICE QUESTIONS 4

Solve the following equations:

a) $||x - 1| + 2| = 3$

$x = 0 \vee x = 2$

c) $3|2|x - 1| - 5| = 6$

$x = -2.5 \vee x = -0.5 \vee x = 2.5 \vee x = 4.5$

e) $|x + 2| + |x - 7| = 3$

$x \in \emptyset$

b) $|2|x + 1| - 4| = 1$

$x = -3.5 \vee x = -2.5 \vee x = 0.5 \vee x = 1.5$

d) $|x + 1| + |x - 6| = 9$

$x = -2 \vee x = 7$

f) $2|3 - x| - 2|x + 1| = 1$

$x = \frac{3}{4}$

Solve the following inequalities

a) $3|x - 5| - 6 > 0$

$x \in (-\infty, 3) \cup (7, \infty)$

c) $||x - 1| - 5| > 3$

$x \in (-\infty, -7) \cup (1, 3) \cup (9, \infty)$

e) $|x + 4| + |x - 5| < 11$

$x \in (-5, 6)$

b) $2|x + 1| - 5 < 0$

$x \in (-3.5, 1.5)$

d) $|2|x + 2| - 6| < 1$

$x \in (-5.5, -4.5) \cup (0.5, 1.5)$

f) $2|x - 1| - |5 - 2x| > 1$

$x \in (2, \infty)$

Solve the following equations

$$\text{a) } (2x + 2)^2 - (x + 1)(2x - 3) = (2x + 1)(x - 2) \quad x = -\frac{3}{4}$$

$$\text{b) } (x - 1)^2 + (3x - 1)(x + 2) = (2x - 1)^2 \quad x = \frac{2}{7}$$

$$\text{c) } (2 - x)(x + 2) + (3x + 4)(x - 7) = (x + 2)^2 + (x + 3)^2 \quad x = -\frac{37}{27}$$

Simplify the following expressions

$$\text{a) } \frac{\sqrt{150} - 2\sqrt{294} + 3\sqrt{726}}{\sqrt{27} - 2\sqrt{192} + 5\sqrt{432}} = \frac{24\sqrt{2}}{47}$$

$$\text{b) } \frac{5\sqrt{392} - \sqrt{162} + 3\sqrt{8}}{\sqrt{175} - \sqrt{252} + 2\sqrt{448}} = \frac{67\sqrt{14}}{105}$$

$$\text{c) } \frac{\sqrt[3]{48} - \sqrt[3]{750} + \sqrt[3]{1296}}{\sqrt[3]{54} - \sqrt[3]{1458} + 5\sqrt[3]{686}} = \frac{3\sqrt[3]{3}}{29}$$