

GATEWAY - EQUATIONS AND INEQUALITIES

PRACTICE

NAME: Buckmire DATE: \_\_\_\_\_ COURSE: 110

Show your work.

(1) Solve for  $x$ :  $x + 5 = 3(x - 2)$

$$x + 5 = 3x - 6$$

$$6 + 5 = 3x - x$$

$$11 = 2x \Rightarrow x = \frac{11}{2}$$

(2) Solve for  $x$ :  $ax - 3 = 2b$

$$ax = 3 + 2b$$

$$x = \frac{3 + 2b}{a} \quad (a \neq 0)$$

(3) Solve for  $x$  by factoring:  $4x^2 + 4x - 3 = 0$

$$4x^2 + 4x - 3 = (2x - 1)(2x + 3)$$

(4) Solve for  $x$ :  $\frac{(2x+13)(3x-5)}{x+7} = 0$

$$2x + 13 = 0 \quad \text{OR} \quad 3x - 5 = 0$$

$$x = -\frac{13}{2} \quad \text{OR} \quad x = \frac{5}{3}$$

(5) Solve for  $x$ :  $\frac{(2x-1)(x+5)}{\sqrt{3-x}} = 0$

$$2x - 1 = 0 \quad \text{OR} \quad x + 5 = 0$$

$$x = \frac{1}{2} \quad \text{OR} \quad x = -5$$

(6) Solve for  $x$  by factoring out the common factor:

$$(x+2)^4(2x-3) - (x+2)^4(x+4) = 0$$

$$(x+2)^4 [(2x-3) - (x+4)] = 0$$

$$x+2=0 \quad \text{OR} \quad 2x-3 = x+4$$

$$x = -2 \quad \text{OR} \quad \begin{array}{l} 2x - x = 3 + 4 \\ x = 7 \end{array}$$

(7) Solve for  $x$  by factoring out the common factor:  $x^{-2}(x-7) + 2x^{-3}(x+3) = 0$

$$x^{-3} [(x-7)x + 2(x+3)] = 0$$

$$x(x-7) + 2x+6 = 0$$

$$x^2 - 7x + 2x + 6 = 0$$

$$x^2 - 5x + 6 = 0$$

$$(x-3)(x-2) = 0$$

$$\Rightarrow x = 3 \text{ or } 2$$

In problems (8), (9), and (10), solve the inequality, and write your answer in interval notation.

(8)  $4 - 3x \leq 6$

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$$4 - 6 \leq 3x$$

$$-2 \leq 3x$$

$$-\frac{2}{3} \leq x$$

(9)  $3 < 2x + 1 \leq 5$

$$2 < 2x \leq 4$$

$$1 < x \leq 2$$

(10)  $-4 > 3 - x > -9$

$$4 < x - 3 < 9$$

$$7 < x < 12$$