

Final Review #10 - Mixed Review

1) Solve and check: $2(a - 5) + 10 = \frac{1}{2}(-8a + 24)$

$$2a - 10 + 10 = -4a + 12$$

$$2a = -4a + 12$$

$$+4a \quad +4a$$

$$\frac{6a}{6} = \frac{12}{6} \quad a = 2$$

2) Write the solution set in **interval notation** and **graph** the solution

$$20 - 2(x+9) \leq 2(x - 5)$$

$$-2x - 18 \leq 2x - 10$$

$$+2x \quad +2x$$

$$-18 \leq 4x - 10$$

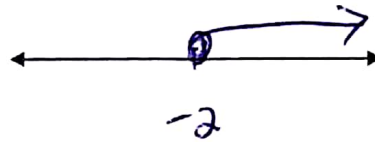
$$+10 \quad +10$$

$$-8 \leq 4x$$

$$\frac{-8}{4} \leq \frac{4x}{4}$$

$$-2 \leq x$$

$$x \geq -2$$



$$[-2, \infty)$$

3) Write the solution set in **interval notation** and **graph** the solution

$$10 - 13(2 - x) > 5(3x - 2)$$

$$-26 + 13x > 15x - 10$$

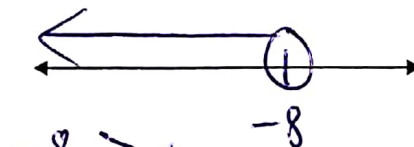
$$-13x \quad -13x$$

$$-26 > 2x - 10$$

$$+10 \quad +10$$

$$-16 > 2x$$

$$\frac{-16}{2} > \frac{2x}{2}$$



$$-8 > x$$

$$x < -8$$

$$(-\infty, -8)$$

4) Determine if the solution to the systems of equations is (4, 6)

$$-5x - y = -26$$

$$6x + 8y = 4$$

$$-5(4) - (6) = -26$$

$$-20 - 6 = -26$$

$$-26 = -26 \checkmark$$

$$6(4) + 8(6) = 4$$

$$24 + 48 \neq 4$$

NO.

5) Evaluate: $f(x) = 4x^2 + 5x - 3$, find $f(-2)$

$$f(-2) = 4(-2)^2 + 5(-2) - 3 = 4(4) - 10 - 3$$

$$16 - 13$$

$$\textcircled{3}$$

6) Solve and check

$$|9 + 4x| = 5x + 18$$

$$9 + 4x = 5x + 18$$

$$\begin{array}{r} -9 \\ 4x = 5x + 9 \\ -5x \quad -5x \\ \hline -1x = 9 \\ x = -9 \end{array}$$

$$-(9 + 4x) = 5x + 18$$

$$\begin{array}{r} -9 - 4x = 5x + 18 \\ -9 \qquad \qquad -9 \\ \hline -4x = 5x + 9 \\ -5x \quad -5x \\ \hline -9x = 9 \quad x = -1 \end{array}$$

7) Express in simplest radical form

$$-2\sqrt{45} - 3\sqrt{20} - 2\sqrt{6}$$

$$\begin{array}{l} \sqrt{9} \sqrt{5} \quad \sqrt{4} \sqrt{5} \\ 3\sqrt{5} \quad 2\sqrt{5} \\ -6\sqrt{5} - 6\sqrt{5} - 2\sqrt{6} \\ -12\sqrt{5} - 2\sqrt{6} \end{array}$$

8) Solve and check

$$(\sqrt{4x-7})^2 = 15^2$$

$$4x - 7 = 225$$

$$\begin{array}{r} +7 \quad +7 \\ \hline 4x = 232 \\ \frac{4x}{4} = \frac{232}{4} \\ x = 58 \end{array}$$

9) Factor: $5x^2 - 18x + 9$

$$5x^2 - 15x - 3x + 9$$

$$5x(x-3) - 3(x-3)$$

$$(5x-3)(x-3)$$

$$\begin{array}{r} 45x^2 \\ \underline{5 \cdot 9} \\ 15 \cdot 3 \end{array}$$

10) Factor $(6ab - 3a)(8b - 4)$

$$3a(2b-1) \cdot 2(2b-1)$$

$$(3a+2)(2b-1)$$

11) Solve for x by completing the square: $x^2 + 6x - 21 = 0$

$$x^2 + 6x = 21$$

$$(x+3)^2 = 21+9$$

$$\sqrt{(x+3)^2} = \sqrt{30}$$

$$x+3 = \pm\sqrt{30}$$

$$x = -3 \pm \sqrt{30}$$

12) Solve and check:

$$|8 + 4x| = 24$$

$$\begin{array}{r} 8+4x=24 \\ -8 \quad -8 \\ \hline 4x=16 \\ x=4 \end{array}$$

$$\begin{array}{r} -(8+4x)=24 \\ -8-4x=24 \\ +8 \quad +8 \\ \hline -4x=32 \\ x=-8 \end{array}$$

13) Solve for the roots of the equation by using the quadratic formula: $4x^2 + 13x - 10 = 0$.

$$a=4$$

$$b=13$$

$$c=-10$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-13 \pm \sqrt{13^2 - 4(4)(-10)}}{2(4)}$$

$$\frac{-13 \pm \sqrt{329}}{8}$$

14) Simplify: $\frac{9x^{-4}y^8z}{3x^2y^{-8}z^4}$

$$3x^{-6}y^{16}z^{-3}$$

$$\frac{3y^{16}}{x^6 z^3}$$

15) Solve for x: $2^{2(x+1)} = 2^{3(x-1)}$

$$\begin{aligned}2(x+1) &= 3(x-1) \\2x+2 &= 3x-3 \\2 &= x-3 \\5 &= x\end{aligned}$$

16) Is $(0, -3)$ a solution of the system of equations: $-5x + y = -3$ and $3x - 8y = 24$

yes!

$$-5(0) - 3 = -3$$

$$-3 = -3$$

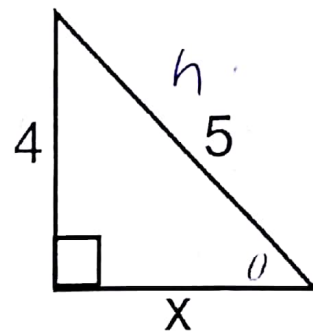
$$3(0) - 8(-3) = 24$$

$$24 = 24$$

17) Use the triangle to the right to answer both parts.

A) Find the value of x.

$$x = 3$$



B) Find the value of angle θ . Round your answer to the nearest degree.

$$\sin^{-1}(4/5) = 53^\circ$$

18) Find the inverse function $f^{-1}(x)$ of $f(x) = 6x + 7$

$$\begin{aligned}x &= 6y + 7 \\x - 7 &= 6y \\ \frac{x-7}{6} &= \frac{6y}{6}\end{aligned}$$

$$\frac{x-7}{6} = f^{-1}(x)$$

19) State the domain of: $\{(3,0) (-1,1) (5,2) (4,7) (-3,4)\}$

$$D \{ 3, -1, 5, 4, -3 \}$$

20) Find the product of $-3x^{-5}$ and $8x^9$.

$$-24x^4$$