

Chapter P1-P4 Practice Test

Pre-Calculus | Mr. Cooper

Name _____

Date _____

Period _____

Grade _____

Completely Simplify:

$$1. \left(\frac{2m^2}{m^5n^{-3}} \right)^{-3} = \left(\frac{2}{m^3n^{-3}} \right)^{-3}$$

$$\frac{2^{-3}}{m^{-9}n^9} = \frac{m^9}{2^3n^9} = \boxed{\frac{m^9}{8n^9}}$$

$$2. \frac{3(5a^4)b^{-7}}{10a^8} = \frac{15a^4b^{-7}}{10a^8} = \frac{3b^{-7}}{2a^4} = \boxed{\frac{3}{2a^4b^7}}$$

$$3. \frac{(2xz^{-3})^4}{z^6x^{18}} = \frac{2^4x^4z^{-12}}{z^6x^{18}} = \boxed{\frac{16}{x^{14}z^{18}}}$$

$$4. \frac{3(8a^8bc^{-5})^{-2}}{(8a^8bc^{-5})^2} = \frac{3}{64a^{16}b^2c^{-10}}$$

$$= \boxed{\frac{3c^{10}}{64a^{16}b^2}}$$

$$5. \left(\frac{14x^{-3}y^4}{7x^{-3}y^{-6}} \right)^{-2} = \left(\frac{2x^3y^4y^6}{x^3} \right)^{-2}$$

$$= (2y^{10})^{-2} = 2^{-2}y^{-20}$$

$$= \boxed{\frac{1}{4y^{20}}}$$

$$6. \frac{3xy^3(x^2y)^3}{x^{-2}} = \frac{3xy^3(x^6y^3)}{x^{-2}} = \frac{3x^7y^6}{x^{-2}}$$

$$= \boxed{3x^9y^6}$$

$$7. \frac{(2xy)^3(2xy)^{-4}}{(2xy)^{-1}} = \frac{(2^3xy^3)(2xy)^{-1}}{(2xy)^{-1+3}}$$

$$= \frac{2^3x^3y^3}{2^3x^3y^3} = \boxed{1}$$

$$8. 3a^{-2} + 2b^{-3} = \frac{3}{a^2} + \frac{2}{b^3}$$

$$= \frac{3b^3}{a^2b^3} + \frac{2a^2}{b^3a^2}$$

$$= \boxed{\frac{3b^3 + 2a^2}{a^2b^3}}$$

Solve the following equations algebraically:

$$9\left(\frac{1}{5}x - \frac{7}{6} = \frac{2}{3}\right) \left(\frac{30}{1}\right)$$

$$\begin{array}{r} 6x - 35 = 20 \\ + 35 \quad + 35 \\ \hline \end{array}$$

$$\frac{6x}{6} = \frac{55}{6}$$

$$\boxed{x = \frac{55}{6}}$$

$$11\left(\frac{4}{5}(10 - 25x) - (4x + 5) = \frac{2}{3}(x + 6)\right) \left(\frac{15}{1}\right)$$

$$12(10 - 25x) - 15(4x + 5) = 10(x + 6)$$

$$120 - 300x - 60x - 75 = 10x + 60$$

$$\begin{array}{r} 45 - 360x = 10x + 60 \\ -60 + 360x \quad + 60x - 60 \\ \hline \end{array}$$

$$\frac{-15}{370} = \frac{370x}{370}$$

$$\boxed{-\frac{3}{74} = x}$$

$$13. \frac{5}{x} + \frac{1}{3} = \frac{8}{x}$$

$$\left(\frac{5}{x} + \frac{1}{3} = \frac{8}{x}\right) \left(\frac{3x}{1}\right)$$

$$\begin{array}{r} 15 + x = 24 \\ -15 \quad -15 \\ \hline \end{array}$$

$$\boxed{x = 9}$$

$$10.\left(18x - \frac{1}{2} = 6x - \frac{3}{4}\right) \left(\frac{4}{1}\right)$$

$$\begin{array}{r} 72x - 2 = 24x - 3 \\ -24x + 2 \quad -24x + 2 \\ \hline \end{array}$$

$$\frac{48x}{48} = \frac{-1}{48}$$

$$\boxed{x = \frac{-1}{48}}$$

$$12.\left(\frac{2x+5}{8} - \frac{3x-5}{4} = \frac{5}{12}\right) \left(\frac{24}{1}\right)$$

$$3(2x+5) - 6(3x-5) = 10$$

$$6x + 15 - 18x + 30 = 10$$

$$\begin{array}{r} -12x + 45 = 10 \\ -45 \quad -45 \\ \hline \end{array}$$

$$\frac{-12x}{-12} = \frac{-35}{-12}$$

$$\boxed{x = \frac{35}{12}}$$

$$14.\left(\frac{5}{3n} - \frac{1}{2} = \frac{1}{2}\right) \left(\frac{6n}{1}\right)$$

$$\begin{array}{r} 15 - n = 9 \\ -9 + n \quad -9 + n \\ \hline \end{array}$$

$$\boxed{6 = n}$$

15. Jennifer went on a shopping spree, spending a total of \$150 on a skirt, a sweater, and a pair of shoes. The cost of the sweater was $\frac{8}{7}$ of the cost of the skirt. The shoes cost \$18 more than the skirt. Find the cost of each item.

$$\text{Skirt} + \text{sweater} + \text{shoes} = 150$$

$$\text{Sweater} = \frac{8}{7}(\text{skirt})$$

$$\text{Shoes} = 18 + (\text{skirt})$$

$$\text{Sweater} = \frac{8}{7}(42) = \$48.00$$

$$\text{Shoes} = 18 + 42 = \$60.00$$

$$\frac{7}{7}(\text{skirt}) + \frac{8}{7}(\text{skirt}) + 18 + \frac{7}{7}(\text{skirt}) = 150$$

$$\left[\frac{22}{7}(\text{skirt}) + 18 = 150\right] \left(\frac{7}{1}\right)$$

$$\begin{array}{r} 22(\text{skirt}) + 126 = 1050 \\ -126 \quad -126 \\ \hline \end{array}$$

$$\frac{22(\text{skirt})}{22} = \frac{924}{22}$$

$$\boxed{\text{skirt} = \$42.00}$$

Solve the following inequalities algebraically and put your answers in **INTERVAL NOTATION**:

$$16. -2x + 17 \geq 5$$

$$\begin{array}{r} -17 \quad -17 \\ \hline -2x \geq -12 \\ -2 \quad -2 \end{array}$$

$$x \leq 6 \quad \text{OR} \quad (-\infty, 6]$$

$$17. \frac{2}{3}x + 7 > -8$$

$$\begin{array}{r} -7 \quad -7 \\ \hline \left(\frac{3}{2}\right) \frac{2}{3}x > -15 \left(\frac{3}{2}\right) \\ x > -\frac{45}{2} \end{array}$$

$$\left(-\frac{45}{2}, \infty\right)$$

$$18. \left(\frac{3-x}{2} + \frac{5x-2}{3} < -1\right) \cdot 6$$

$$3(3-x) + 2(5x-2) < -6 \quad \frac{7x < -11}{7}$$

$$9 - 3x + 10x - 4 < -6 \quad x < -\frac{11}{7}$$

$$\begin{array}{r} 5 + 7x < -6 \\ -5 \quad -5 \\ \hline 7x < -11 \end{array} \quad \left(-\infty, -\frac{11}{7}\right)$$

$$19. 3x - 1 \leq 6x + 8$$

$$\begin{array}{r} -3x \quad -8 \quad -3x \quad -8 \\ \hline -7 \leq 3x \\ 3 \quad 3 \end{array}$$

$$x \geq -\frac{7}{3}$$

$$\left[-\frac{7}{3}, \infty\right)$$

$$20. 4 \leq 4 - y < 28$$

$$\begin{array}{r} -4 \quad -4 \quad -4 \\ \hline 0 \leq -y < 24 \\ -1 \quad -1 \quad -1 \end{array}$$

$$0 \geq y > -24 \quad \text{OR}$$

$$-24 < y \leq 0$$

$$\left[-24, 0\right]$$

$$21. \left(2 \geq \frac{2y+16}{6} \geq -8\right) \cdot 6$$

$$\begin{array}{r} 12 \geq 2y + 16 \geq -48 \\ -16 \quad -16 \quad -16 \end{array}$$

$$\begin{array}{r} -4 \geq 2y \geq -64 \\ 2 \quad 2 \end{array}$$

$$-2 \geq y \geq -32 \quad \text{OR}$$

$$-32 \leq y \leq -2$$

$$\left[-32, -2\right]$$

Write an equation of the line that passes through the points (1, -8) and (-2, -3)

$$\text{slope: } \frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 + 3}{1 + 2} = \frac{-5}{3}$$

$$\text{Point slope form: } y + 3 = -\frac{5}{3}(x + 2)$$

$$\boxed{y = -\frac{5}{3}x - \frac{19}{3}}$$

$$\begin{array}{r} y + 3 = -\frac{5}{3}x - \frac{10}{3} \\ -3 \quad -3 \quad -3 \quad -9 \end{array}$$

Write an equation of a line parallel to the line $y = -\frac{2}{5}x - 4$ that passes through the point (3, 4).

$$M = -\frac{2}{5}$$

* if perpendicular $m = \frac{5}{2}$

$$\text{point slope form: } y - 4 = -\frac{2}{5}(x - 3)$$

$$\boxed{y = -\frac{2}{5}x + \frac{26}{5}}$$

$$\begin{array}{r} y - 4 = -\frac{2}{5}x + \frac{6}{5} \\ +4 \quad +4 \quad +4 \quad 20 \end{array}$$