

Name _____
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Intermediate Algebra - MTH 104
Class #5

Station 1. Order of Operations

- $-9 - (-5) - |-7|$
 $= -9 + 5 - 7$
 $= -11$
- $3[4 + (-2)(8)] + 3^3$
 $= 3[4 + (-16)] + 27$
 $= 3[-12] + 27$
 $= -36 + 27$
 $= -9$
- Evaluate: $5x^2 + 4x$ when $x = -2$
 $= 5(-2)^2 + 4(-2)$
 $= 5(+4) - 8$
 $= ~~12~~$
 $= +20 - 8 = 12$
- Evaluate: $\left(-\frac{5}{3}\right)^3 = \left(-\frac{5}{3}\right)\left(-\frac{5}{3}\right)\left(-\frac{5}{3}\right)$
 $= -\frac{125}{27}$
- Evaluate: $4x^2 - 3y - 10$ when $x = 4$ and $y = -1$
 $4(4)^2 - 3(-1) - 10$
 $= 4(16) + 3 - 10$
 $= 64 + 3 - 10$
 $= 57$

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Station 2 - Positive Exponents - Rules of Exponents

Write all final answers with positive exponents only.

- Simplify: $(-7w^{-7})(-5w^{-3}) = +35w^{-10}$
 $= +\frac{35}{w^{10}}$
- Simplify: $(-10x^5y^2)^2 = +100x^{10}y^4$
- Simplify: $\left(\frac{3x}{4y^2}\right)^{-2} = \left(\frac{4y^2}{3x}\right)^2 = \frac{16y^4}{9x^2}$ ← Square Reciprocal
- Simplify: $\left(\frac{10x^2y}{5xy}\right)^{-3} = \left(\frac{2x}{1x}\right)^{-3} = (2x)^{-3} = \frac{1}{8x^3}$
- Simplify: $\left(\frac{x^8y^{-2}}{x^2y^3}\right)^2 = \left(\frac{x^{16}y^{-4}}{x^{-4}y^6}\right)^2 = \frac{x^{16}x^4}{y^6y^4} = \frac{x^{20}}{y^{10}}$

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Station 3: Scientific Notation

1. Write in Proper Scientific Notation:

a. 0.041 4.1×10^{-2}

b. 760,000 7.6×10^5

c. 0.0000126 1.26×10^{-5}

d. 40,500,000 4.05×10^7

2. Express each value in Scientific Notation:

a. $(4.78 \times 10^9)(1.96 \times 10^5)$ 9.37×10^{14}

b. $(8.32 \times 10^{-8})(9.14 \times 10^{-2}) = 76.04 \times 10^{-10} = 7.60 \times 10^{-9}$

c. $\frac{4.36 \times 10^{-4}}{8.17 \times 10^{-8}} = 534 \times 10^4$ 5.34×10^3

d. $\frac{3.11 \times 10^{11}}{4.72 \times 10^{-9}} = 659 \times 10^{20}$ 6.59×10^{19}

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Station 4: Equations and Literal Equations

1. Solve and check for the Given Variable.

a. $5x + 3 - 2x = 9$ $x = 2$
 $5(z) + 3 - 2(z) = 9$
 $10 + 3 - 4 = 9$
 $3x + 3 = 9$
 $-3 - 3$
 $3x = 6$
 $x = 2$
 $9 = 9 \checkmark$

b. $4x - 8 = -4(2x - 3) + 4$ $x = 2$
 $4x - 8 = -8x + 12 + 4$ $12x = 74$ $x = 7$
 $4x - 8 = -8x + 16$
 $+8x$
 $12x - 8 = -4(2x - 3) + 4$
 $8 - 8 = -4(4 - 3) + 4$
 $0 = -4(1) + 4$
 $0 = -4 + 4$
 $0 = 0 \checkmark$

c. $\frac{1}{2}(6r - 10) = 7(z)$ $r = 4$
 $6r - 10 = 14$
 $+10 +10$
 $6r = 24$
 $r = 4$
 $\frac{1}{2}(6(4) - 10) = 7$
 $\frac{1}{2}(24 - 10) = 7$
 $\frac{1}{2}(14) = 7$
 $7 = 7 \checkmark$

d. Solve for x: $ax + bcx = D$ $x = \frac{D}{(a+bc)}$
 $x(a+bc) = \frac{D}{(a+bc)}$

e. Solve for h: $A = \frac{bh}{2}$ $\frac{2A}{b} = h$
 $\frac{2A}{b} = \frac{bh}{b}$
 $\frac{2A}{b} = h$

Station 5: Word Problems

1. Kate buys a monthly bus pass, which will entitle her to unlimited bus rides for \$45 per month. Without the pass, the rides are \$1.80 per ride. How many rides will Kate have to pay for to make the monthly fee a better deal?

$x = \# \text{ of Rides}$
 $\begin{array}{r} 45 = 1.80x \\ 1.80 \quad 1.80 \end{array}$ $25 \text{ Rides is the Break even.}$
 $25 = x$

2. The length of a rectangle is represented by $5x - 7$ and the width is represented by $3x + 2$. If the perimeter of the rectangle is 70 inches, find the dimensions of the rectangle.

$P = 16x - 10$ Length = 18
 $70 = 16x - 10$ Width = 17
 $\begin{array}{r} 3x+2 \\ 5x-7 \end{array}$ $\frac{80x = 16x}{16} \quad x = 5$

3. How many pounds of candy worth 70 cents per pound must be mixed with 30 pounds of candy worth 90 cents per pound to produce a mixture which can be sold for 85 cents per pound?

Kind of Nut	Amount	Value	Total
70 cent	x	70	$70x$
90 cent	30	90	$90(30)$
85 Mix	$(x+30)$	85	$85(x+30)$

$70x + 90(30) = 85(x+30)$ { 10 lbs of 70 cent }
 $70x + 2700 = 85x + 2550$ { 10 lbs }
 $-70x \quad -70x$
 $2700 = 15x + 2550$
 $-2550 \quad -2550$
 $150 = 15x$
 $10 = x$

4. A sum of \$3500 is invested at two rates. Part is invested at a 5% rate and the rest at an 8% rate. The total annual return is \$250. Find the amount invested at each rate.

Investment	Amount	Rate	Total
5%	$(3500 - x)$.05	$.05(3500 - x)$
8%	x	.08	$.08x$

$.05(3500 - x) + .08x = 250$ $.03x = 175$
 $175 - .05x + .08x = 250$ $\frac{.03x}{.03} = \frac{175}{.03}$
 $175 + .03x = 250$ $x = 2500$
 $-175 \quad -175$ $\$2500 @ 8\%$
 $\$1000 @ 5\%$

5. Find three consecutive even integers such that the sum of the smallest and twice the second is 20 more than the third.

$x = 1st \text{ Even Int} = 10$
 $(x+2) = 2nd \text{ Even Int} = 12$
 $(x+4) = 3rd \text{ Even Int} = 14$
 $x + 2(x+2) = (x+4) + 20$
 $x + 2x + 4 = x + 24$
 $3x + 4 = x + 24$
 $-x \quad -x$
 $2x + 4 = 24$
 $-4 \quad -4$
 $2x = 20$
 $x = 10$