

Name: Key Period: \_\_\_\_\_ Your Score: \_\_\_\_\_**Instructions:** Do all work on this worksheet. Show all steps that lead to your solution. Remember that we work down, not across. Check all your answers on Mrs. Dunphy's blog and write your score above.

1. Simplify.

(A)  $6^2 - 8 \div 2 + 5$

$36 - 4 + 5$

$\boxed{37}$

(B)  $(6^2 - 8) \div 2 + 5$

$(36 - 8) \div 2 + 5$

$28 \div 2 + 5$

$14 + 5$

$\boxed{19}$

(C)  $(6^2 - 8) \div (2 + 5)$

~~$(36 - 8) \div 2 + 5$~~

$(36 - 8) \div (7)$

$28 \div 7$

$\boxed{4}$

2. Simplify.  $16 - 3[9 - 2(5 - 3)]$

$16 - 3[9 - 2(2)]$

$16 - 3[5]$

$16 - 15 = \boxed{1}$

3. Simplify.  $3 \cdot 2^3 - (7^2 - 5^2)$

$3 \cdot 8 - (49 - 25)$

$24 - 24$

$\boxed{0}$

4. Simplify.  $\frac{1}{2} \left| \frac{1 - 9^2}{5^2} \right|$

$\frac{1}{2} \left| \frac{1 - 81}{25} \right| = \frac{1}{2} \left| \frac{-80}{25} \right| = \frac{1}{2} \left| -\frac{16}{5} \right|$

$= \frac{1}{2} \left( \frac{16}{5} \right) = \boxed{\frac{8}{5}}$

5. Evaluate for  $x = 2, y = -4, z = -6$

$\left( \frac{xyz}{x + y + z} \right)^3 = \left( \frac{(2)(-4)(-6)}{2 + (-4) + (-6)} \right)^3$

$= \left( \frac{48}{-8} \right)^3 = (-6)^3 = \boxed{-216}$

6. Simplify.  $[-5 + (-17)] - (3 - 7 + 2)$

$[-22] - (-4 + 2)$

$(-22) - (-2)$

$-22 + 2 = \boxed{-20}$

7. Simplify.  $|-21 - 3| - |8 + (-12)|$

$|-24| - |-4|$

$= 24 - 4 = \boxed{20}$

8. Simplify.  $(-6m - 3n + 2) + 5(m - 2n + 1)$

$-6m - 3n + 2 + 5m - 10n + 5$

$\boxed{-m - 13n + 7}$

9. Simplify.  $-3^2(-x)^3(5 - 3 \cdot 2)$

$(-9)(-x^3)(5 - 6)$

$(9x^3)(-1)$

$\boxed{-9x^3}$

10. Write the property that was used to make each step in the simplification below.

$$\begin{aligned} a(b + 1) + (-1)a &\rightarrow \\ &= a(b + 1) + a(-1) \\ &= a[(b + 1) + (-1)] \\ &= a[b + (1 + (-1))] \\ &= a[b + 0] \\ &= ab \end{aligned}$$

- a. commutative
- b. distributive (factored out the a)
- c. associative (changed grouping)
- d. opposites
- e. identity of addition

11. Simplify.  $\frac{1}{2}(-6)\left(-\frac{1}{12}\right)(-12)$

$$\begin{aligned} &(-3)\left(-\frac{1}{12}\right)(-12) \\ &(-3)(1) = \boxed{-3} \end{aligned}$$

12. Simplify.  $-3^2(-1)^8(-3)^2$

$$\begin{aligned} &(-9)(1)(9) \\ &\boxed{-81} \end{aligned}$$

13. Simplify.  $-\frac{1}{3} \div \left(-\frac{1}{6}\right) \div (-4)$

$$\begin{aligned} &-\frac{1}{3} \cdot \frac{-6}{1} \div -4 \\ &2 \div (-4) \\ &\boxed{-\frac{1}{2}} \end{aligned}$$

14. Simplify.  $\frac{4^2 - 3^2}{4 - (-3)}$

$$\frac{16 - 9}{4 + 3} = \frac{7}{7} = \boxed{1}$$

15. Simplify.  $\frac{-8\left(-\frac{1}{2} - \frac{1}{4}\right)}{-\frac{3}{4} \div 3}$

$$\begin{aligned} &\frac{-8\left(-\frac{3}{4}\right)}{-\frac{3}{4} \cdot \frac{1}{3}} = \frac{6}{-\frac{1}{4}} = (6)(-4) = \boxed{-24} \\ \text{OR} &\frac{-8\left(-\frac{3}{4}\right)}{\left(-\frac{3}{4}\right)\left(\frac{1}{3}\right)} = \frac{-8}{\frac{1}{3}} = (-8)(3) = \boxed{-24} \end{aligned}$$

16. Simplify.  $\frac{-27\left[12 \div \left(-\frac{3}{4}\right)\right]}{\frac{12}{1}\left(-\frac{3}{4}\right)} = \frac{-27\left[\frac{12}{1} \cdot \frac{-4}{3}\right]}{-9}$

$$\begin{aligned} &\frac{-27[-16]}{-9} = 3[-16] \\ &= \boxed{-48} \end{aligned}$$

17. Solve.  $\frac{1.2(u-2)}{1.2} = \frac{4.8}{1.2}$

$$\begin{aligned} (u-2) &= 4 \\ u &= 6 \end{aligned}$$

$\boxed{\{6\}}$

18. Solve.  $\left[0.4(2r+3) = 0.6r + 3.6\right] 10$

$$\begin{aligned} 4(2r+3) &= 6r + 36 \\ 8r + 12 &= 6r + 36 \\ -6r - 12 &\quad -6r - 12 \\ \hline 2r &= 24 \\ r &= 12 \end{aligned}$$

$\boxed{\{12\}}$

19. Solve.  $\left[ \frac{1}{5}(x+3) = x-5 \right] 5$

$$x+3 = 5x-25$$

$$3 = 4x-25$$

$$28 = 4x$$

$$x = 7$$

$\{7\}$

21. Solve for  $b$ .  $A = 0.5h(a+b)$

$$A = 0.5ha + 0.5hb$$

$$-0.5ha \quad -0.5ha$$

$$\boxed{\frac{A - 0.5ha}{0.5h}} = \frac{0.5hb}{0.5h}$$

23. A piggy bank contains 70 coins (nickels and dimes) worth \$5.55. How many of each type of coin are in the bank?

$n, d = \text{number of coins}$

$$n+d=70 \rightarrow n=70-d$$

$$5n + 10d = 555$$

$$5(70-d) + 10d = 555$$

$$350 - 5d + 10d = 555$$

$$5d = 205$$

$$\boxed{d=41, n=29}$$

The bank has 41 dimes and 29 nickels.

20. Solve for  $x$ .  $ax+by+c=0$

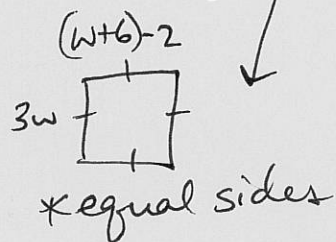
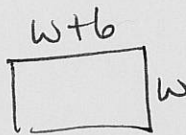
$$-by-c \quad -by-c$$

$$\frac{ax}{a} = \frac{-by-c}{a}$$

22. Solve for  $r$ .  $\frac{L}{2\pi h} = \frac{2\pi rh}{2\pi h}$

$$\boxed{\frac{L}{2\pi h} = r}$$

24. The length of a rectangle is 6 cm more than its width. If you reduce the length by 2 cm and triple the width, the rectangle becomes a square. What are the dimensions of the rectangle?



$$(w+b)-2 = 3w$$

$$w+4 = 3w$$

$$4 = 2w$$

$$\boxed{w=2, \therefore l=8}$$

The width of the rectangle is 2 cm and the length is 8 cm.



25. One train leaves Phoenix at 10 A.M. headed for Ventura, CA 432 miles away. Another train leaves Ventura at the same time headed for Phoenix. The train rates differ by 8 mi/h. If they meet at 2 P.M., how fast is each train traveling? (HINT: It does not matter which train is moving faster)

PHX  $\longrightarrow$  Ven

PHX  $\longleftarrow$  Ven

432 mi  
total

\*both leave @ 10, meet @ 2  
 $\rightarrow$  4 hours each

$R \times T = D$			
$T_1$	$R$	4	$4R$
$T_2$	$R+8$	4	$4R+32$

\*add the distances

$$4R + 4R + 32 = 432$$

$$8R = 400$$

$$R_1 = 50$$

$$R_2 = 58$$

One train is going 50 mph  
and the other is going 58 mph.

26. A company manufactures large batches of soup consisting of meat and vegetables. Meat costs \$7/lb and vegetables cost \$2/lb. If the company makes 200 lb batches of soup and their final cost must be \$2.50/lb, how many pounds of each ingredient must they add? (HINT: Think of this like a coin problem, but the "coins" have different names and values)

$$m + v = 200 \text{ (pounds)}$$

$$m = 200 - v$$

$$7m + 2v = \underbrace{2.50(200)}_{\text{total batch}}$$

$$7(200 - v) + 2v = 500$$

$$1400 - 7v + 2v = 500$$

$$-5v = -900$$

$$v = 180$$

$$m = 20$$

They must add  
180 lb of veggies and  
20 lb of meat.

\*you can also do  
 $r + r - 8$   
and get  $r = 58$