

There are 27 problems. Each problem is worth 4 points for a total of 108 points.

1. Multiply.

$$a) \frac{1}{8} \cdot \frac{15}{54} \cdot 3$$

$$\frac{5}{8}$$

b)  $\left(\frac{14}{7}\right)\left(\frac{24}{7}\right)$

$$\frac{8}{1}$$

2. Perform the indicated operation.

a) Add:  $\frac{5}{8} + \frac{20}{7}$

$$\frac{25}{28} + \frac{40}{28} = \frac{65}{28}$$

$$\frac{39}{40}$$

b) Subtract:  $\frac{13}{7} - \frac{15}{20}$

$$\frac{28}{28} - \frac{21}{28} = \frac{7}{28} = \frac{1}{4}$$

3. Divide.

a)  $\frac{13}{4} \div \frac{7}{4}$

$$\frac{13}{7}$$

b)  $\frac{11}{25} \div \frac{5}{33}$

$$\frac{11}{25} \times \frac{33}{5} = \frac{363}{125}$$

4. Evaluate the following expressions.

a)  $-|-18|$

$$-18$$

b)  $|-6|$

$$6$$

5. Insert either  $<$ ,  $>$ , or  $=$  to make the statement true.

a)  $-|-2|$   $| -1|$

$$-2 < 1$$

b)  $-3.05$   $- 3.01$

$$-3.05 < -3.01$$

c)  $3.34$   $|-3.34|$

$$3.34 = 3.34$$

6. Evaluate each expression.

a)  $-31 - 23$  -54

b)  $-18 - (-4)$  -14  
 $-18 + 4$

7. Evaluate each expression.

a)  $(-5)^2 (-5)(-5)$  25

b)  $-5^2 - 1 \cdot 5^2$  -25

8. Evaluate the expression.

$$\begin{aligned} & [(3-4)^2 - (5-2)^2] \cdot 3^2 - 2 \cdot 3 \\ & [(-1)^2 - (3)^2] \cdot 3^2 - 2 \cdot 3 \\ & (1-9) \cdot 3^2 - 2 \cdot 3 \\ & (-8)(9) - 2 \cdot 3 \\ & -72 - 2 \cdot 3 \\ & -72 - 6 \end{aligned}$$

-78

9. Evaluate the expression for the given value of the variable.

$x^2 + 2x + 3$  for  $x = -3$

$$\begin{aligned} & (-3)^2 + 2(-3) + 3 \\ & 9 + (-6) + 3 \\ & 9 - 6 + 3 \\ & 12 - 6 \end{aligned}$$

6

10. Evaluate each expression, if possible. If not possible, then explain why not.

a)  $\frac{0}{4}$

a)  $\frac{4}{4}$

b)  $\frac{0}{4}$

b)  $\frac{4}{4}$

11. Complete the statement using the given property:

- a) Commutative Property of Addition  $x + 5 = 5 + x$
- b) Commutative Property of Multiplication  $3(x + y) = (x + y)3$
- c) Associative Property of Addition  $(3 + 5) + 7 = 3 + (5 + 7)$
- d) Distributive Property:  $2(x + y) = 2x + 2y$

12. Name the property.

- a)  $2 + (x + y) = (x + y) + 2$  - contradiction
- b)  $(x + 2)5 = 5(x + 2)$  - CFM
- c)  $(x + y)4 = x \cdot 4 + y \cdot 4$  - Distributive property
- d)  $(x + 3) + y = x + (3 + y)$  - AFA

13. Combine Like Terms:  $x + 6 - 5x - 14$

$x - 5x + 6 - 14$   
 $-4x - 8$

14. Distribute and Combine Like Terms  $-(4x + 2 - 3y)$

$-4x - 2 + 3y$

CPM = commutative property multiplication  
 CPA = commutative property addition  
 AFA = associative property addition  
 APM = associative property multiplication

15. Simplify:  $(2x+1) - 3(-4x+2)$

$$-2x - 1 + 12x - 6$$

$$10x - 7$$

16. Is  $x = \frac{5}{-2}$  a solution of the equation  $2x + 7 = 5 - 3x$ ?

$$2\left(-\frac{5}{2}\right) + 7 = 5 - 3\left(-\frac{5}{2}\right)$$

$$\begin{aligned} -\frac{4}{5} + 7 &= 5 + \frac{5}{6} \\ -\frac{4}{5} + \frac{35}{5} &= \frac{25}{5} + \frac{5}{6} \\ \frac{31}{5} &= \frac{31}{6} \end{aligned}$$

17. Solve the following equation:  $3.68 = 4.74 - x$

$$3.68 - 4.74 = -x$$

$$-1.06 = -x$$

$$x = 1.06$$

$$\begin{aligned} 2x + 7 &= 5 - 3x \\ 2x + 3x &= 5 - 7 \\ 5x &= -2 \\ x &= \frac{-2}{5} \end{aligned}$$

YES

18. Solve the following equation:  $\frac{-3}{5}x = 17$

$$x = 17\left(\frac{5}{-3}\right)$$

$$x = -\frac{85}{3}$$

$$\begin{aligned} \left(\frac{1}{5}\right)\left(\frac{-3}{5}\right)x &= 17\left(\frac{1}{5}\right) \\ \left(\frac{-3}{25}\right)x &= \frac{17}{5} \\ -3x &= \frac{85}{5} \\ -3x &= 17 \\ x &= \frac{17}{-3} \end{aligned}$$

19. Solve the following equation:  $\frac{1}{-3}x = \frac{6}{5} - \left(-\frac{1}{3}\right)$

$$x = -\frac{27}{5}$$

20. Solve the following equation:  $5x + 10 - 2x = 3x + 8 - 4x$

$$3x + 10 = -x + 8$$

$$4x = -2$$

$$x = -\frac{2}{4}$$

$$x = -\frac{1}{2}$$

21. Solve the following equation:  $0.13x - 1.53 = 1.22 - 2x$

$$0.13x + 2x = 1.22 + 1.53$$

$$2.13x = 2.75$$

$$\frac{2.13}{2.13} = \frac{2.75}{2.13}$$

OR

$$x \approx 1.29$$

$$\frac{275}{213}$$

$\approx$  means approx equal to

22. Solve the following equation:  $-\frac{5}{2}x - 4 = \frac{2}{3}$

$$-\frac{5}{2}x = \frac{2}{3} + 4$$

$$-\frac{5}{2}x = \frac{14}{3}$$

$$\left(-\frac{3}{5}\right)\left(-\frac{5}{2}x\right) = \left(-\frac{3}{5}\right)\left(\frac{14}{3}\right)$$

$$x = -\frac{28}{15}$$

23. Solve the following equation:  $5(x-2) - 3(x+2) = -(x-1)$

$$5x - 10 - 3x - 6 = -x + 1$$

$$5x - 3x - 16 = -x + 1$$

$$2x - 16 = -x + 1$$

$$+x + 16$$

$$x = \frac{17}{3}$$

24. Percents

a) Write  $\frac{3}{4}$  as a percent:

$$75\%$$

b) Write 3.79 as a percent:

$$379\%$$

$$3.79 \times 100$$

c) Write 87% as a decimal:

$$0.87$$

d) Write 85% as a fraction:

$$\frac{85}{100} = \frac{17}{20}$$

Really this is the fraction for 85%... but we should reduce to their lowest terms.

25. Word Problem

Do three of the following four word problems. You may do the fourth for extra credit. Be sure to mark the extra credit problem.

a. After a 25% price reduction, a new CD player was on sale for \$590.25. What was the original price of the CD player?

$x = \text{orig price}$

$$1x - .25x = 590.25$$

$$.75x = 590.25$$

$\$787.00$  was the original price of the CD player

b. The length of a rectangle is 4 more than five times the width. If the perimeter is 32 meters, what are the dimensions of the rectangle?

$$w + w + (5w + 4) + (5w + 4) = 32$$

$$12w + 8 = 32$$

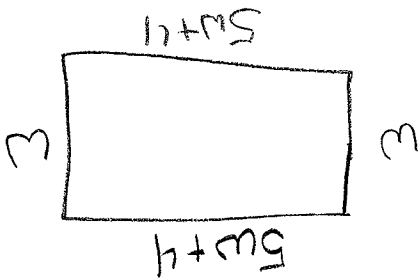
$$12w = 24$$

$$w = 2$$

width = 2 meters  
length = 14 meters

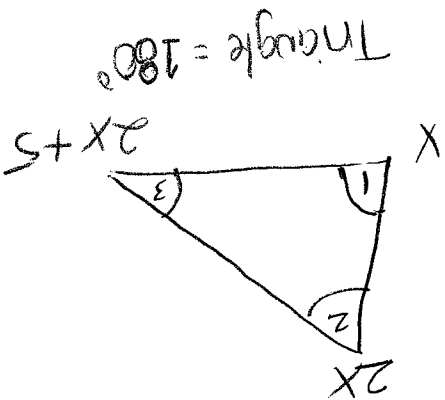
$$2 + 2 + 14 + 14 = 32 \text{ meters}$$

$$w + w + l + l = P$$



$P = 32M$   
 $P = 2w + 2l$

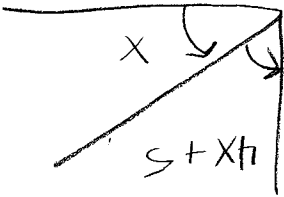
c. The second angle of a triangle is twice as large as the first. The third angle is 5° more than twice the first angle. What is the measure of each angle?



$$\begin{aligned} m\angle 1 &= 35^\circ \\ m\angle 2 &= 70^\circ \\ m\angle 3 &= 75^\circ \end{aligned}$$

$$\begin{aligned} x + 2x + (2x + 5) &= 180 \\ 5x + 5 &= 180 \\ \frac{5x}{5} &= \frac{175}{5} \\ x &= 35^\circ \\ 2x &= 70^\circ \\ 2x + 5 &= 75^\circ \\ \hline 180^\circ \end{aligned}$$

d. Two angles are complementary. The measure of the second angle is 5 more than four times the ~~second~~ <sup>first</sup>. Find the measure of each angle.



$$\begin{aligned} m\angle 1 &= 17^\circ \\ m\angle 2 &= 73^\circ \\ \hline 90^\circ \end{aligned}$$

$$\begin{aligned} x + 4x + 5 &= 90 \\ 5x + 5 &= 90 \\ \frac{5x}{5} &= \frac{85}{5} \\ x &= 17 \end{aligned}$$