



Jakarta International
School
7th Grade

Name: Master

Date: _____

Practice Test - Blue
Algebraic Expressions and Integers

Score:

45

Clearly show required work. Check Carefully!

1. Write a variable expression for the word phrase. (2)

a) 5 less than the quotient of 10 and the product of 2 and a number.

$$10 \div 2n - 5$$

2. James is at a point 3 km from home. He starts riding his bike at $\frac{1}{4}$ km per minute toward home. Justin rides for x minutes. (6pts)

a) Write an expression for the number of kilometers he has ridden.

$$\frac{1}{4}x$$

b) Write an expression for the number of kilometers he is away from home.

$$3 - \frac{1}{4}x$$

c) How far is he from home after 8 minutes?

$$3 - \frac{1}{4}(8)$$

$$3 - 2$$

$$\boxed{1}$$

After 8 minutes James will be 1 km from home.

3. Use the formula $\frac{1}{G} = \frac{1}{g_1} + \frac{1}{g_2} + \frac{1}{g_3}$ to evaluate G when $g_1 = \frac{3}{4}, g_2 = \frac{5}{8}, g_3 = 1\frac{1}{2}$ (3pts)

$$\frac{1}{G} = \frac{1}{\frac{3}{4}} + \frac{1}{\frac{5}{8}} + \frac{1}{1\frac{1}{2}} \rightarrow \text{Improper} = \frac{3}{2}$$

$$\frac{1}{G} = \frac{4}{3} + \frac{8}{5} + \frac{2}{3}$$

$$\frac{1}{G} = \frac{20}{15} + \frac{24}{15} + \frac{10}{15}$$

$$\frac{1}{G} = \frac{54}{15}$$

$$\frac{1}{G} = \frac{18}{5}$$

$$\boxed{G = \frac{5}{18}}$$

reciprocals ($\frac{1}{\frac{3}{4}} = \frac{4}{3}$)

$$x=8 \quad y=8-13 \quad z=5(8+12) \\ z=100$$

4. Evaluate the expression when $x = 8$, $y = x-13$ and $z = -y(x+12)$
Show your steps for full value. (6pts)

a) $x + [2 \cdot (z \div y) - 3]$

$$\begin{aligned} 8 + [2 \cdot (100 \div -5) - 3] \\ 8 + [2 \cdot -20 - 3] \\ 8 + (-40 - 3) \\ 8 + (-40 + -3) \\ 8 + -43 \\ \boxed{-35} \end{aligned}$$

b)

$$\begin{aligned} \frac{|y| + 18 \div 2}{23 - 2x} \\ \frac{|-5| + 18 \div 2}{23 - 2 \cdot 8} \\ \frac{5 + 9}{23 - 16} \\ \frac{14}{7} = \boxed{2} \end{aligned}$$

5. Insert an operation symbol for addition, subtraction, multiplication, or division in each blank to make the statement true. (1)

$$60 \underline{-} (4 \underline{+} 6) \underline{+} 5 \underline{\times} 3 = 65$$

6. Order the numbers from least to greatest. (2)

$$\begin{aligned} -|23|, -|-18|, 19, -|-(21)|, 27, -17, -(-19) \\ -|23|, -|-18|, 19, -|-(21)|, 27, -17, -(-19) \\ \text{or } -23, -21, -18, 17, 19, 19, 27 \end{aligned}$$

7. Tell whether x is a positive integer or a negative integer. (2)

$$-x = -|x| \quad \text{positive}$$

8. Evaluate the expression when $a = -7$ and $b = 8$. (2pts)

$$\begin{aligned} -|b - (-a)| \rightarrow \text{the opposite of } a \\ -|8 - (7)| \\ -|8 - 7| \\ -|1| \\ \boxed{-1} \end{aligned}$$

9. In the statement, a and b are nonzero integers. Explain what must be true about the values of a and b . (2)

$$|a+b| = |a| + |b|$$

Either:

- ① Both a and b are positive
 or
 ② Both a and b are negative.

10. The variables a and b are integers. Tell whether the value of the expression is positive, negative or could be either under the given conditions. (2)

$$|b| - a \quad \text{given that} \quad b < a$$

The value of the expression could be either positive or negative.

11. You have the choice of answering **either** of the following questions with full explanations. (3)

a) Can the sign of $(a-b)$ be determined by knowing only the signs of a and b ? Provide an explanation or counterexample for each case.

b) When is $|a-b| > |a| - |b|$? Give an example.

a) If a and b are positive: NO. (ex $a=3, b=4$ or $a=4, b=3$)

• If a and b are negative: No. (ex $a=-7, b=-5$ or $a=-5, b=-7$)

• If a is positive and b is negative: Yes, $a-b$ is positive because the opposite of b is positive. The sum of two positive numbers is positive.

• If a is negative and b is positive: Yes, $a-b$ is negative. The opposite of b is negative. The sum of 2 negative numbers is negative.

b) $a < 0 < b$, $0 < a < b$, $b < a < 0$, $b < 0 < a$.

12. What would be the value of n if the average of these numbers was -7 ? (2)

4, -12, -18, 2, n

$$4 + -12 + -18 + 2 = -24 + n$$

$$(-24 + n) \div 5 = -7$$

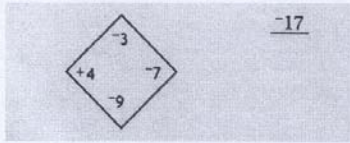
$$(-24 + \underline{-11})$$

$$\downarrow$$

$$-35 \div 5 = -7$$

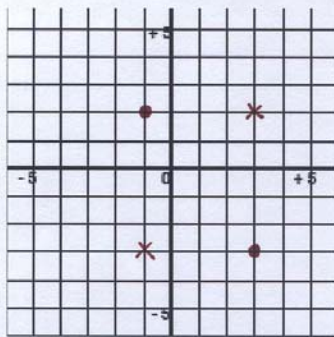
$$n = -11$$

13. Each diamond has four integers. If you perform three different operations on these integers, you will produce the underlined amount. (3)



- A. $\underline{-7x - 9 = 63}$
 B. $\underline{63 \div -3 = -21}$
 C. $\underline{-21 + 4 = \underline{-17}}$

14. The points $(-1, 2)$ and $(3, -3)$ are two vertices of a right triangle. What are the possible coordinates of the third point? Use the following coordinate plane to find your solutions. What is the area of the triangle? (3)



The coordinates of the third point could be $(3, 2)$ or $(-1, -3)$

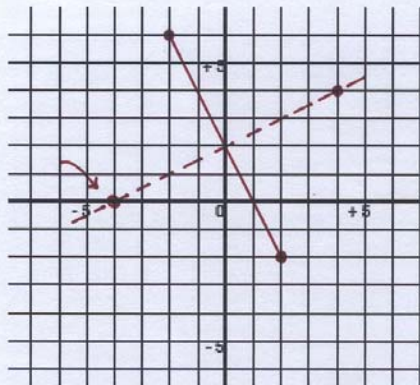
The area is $\frac{bh}{2}$

$$= \frac{(4)(5)}{2}$$

$$= \frac{20}{2} = \boxed{10 \text{ sq. units}}$$

15. What can be determined about the signs of x and y if (x, y) lies.... (2pts)

- a) in the second quadrant x is negative, y is positive.
 b) on the y -axis x is 0, y could be either positive or negative.



16. If a coordinate plane were placed on top of the map of "Math City", Algebra Lane would go through the points $(-2, 6)$ and $(2, -2)$. Geometry Boulevard runs perpendicular to Algebra Lane and passes through the points $(4, 4)$ and $(-4, y)$. What is the value of y ? Carefully find this answer using the graph paper provided, a ruler and a protractor. (4)

The value of y is 0.
See graph.