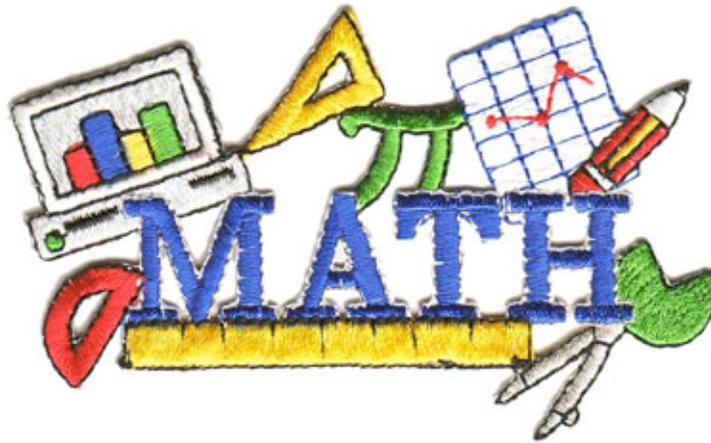


8th Grade Math

Benchmark 1

Parent Handbook



This handbook will help your child review material learned this quarter, and will help them prepare for their first Benchmark Test. Please allow your child to work independently through the material, and then you can check their work using the answer key in the back of the handbook. If you have any questions or concerns about this material, please contact your child's teacher.

Thank you for your support.

Eighth Grade Benchmark #1

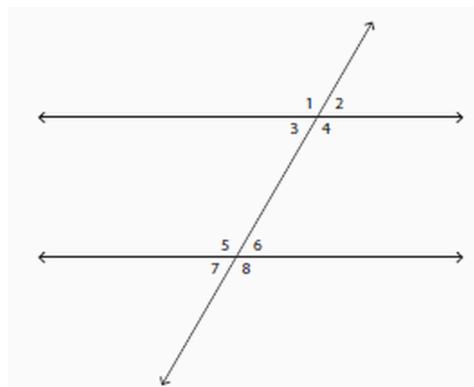
Math Essential Standards

Learning Objective #1:

 "Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles."

Practice:

Use the diagram below to answer Questions #1 - #3.



1. What is the angle relationship between $m\angle 1$ and $m\angle 8$?
 - a. complementary angles
 - b. alternate interior angles
 - c. no relationship
 - d. alternate exterior angles
2. What is the angle relationship between $m\angle 2$ and $m\angle 3$?
 - a. supplementary angles
 - b. vertical angles
 - c. alternate interior angles
 - d. alternate exterior angles
3. If $m\angle 7$ is 65° , what is the measure of $\angle 3$? Why?

Learning Objective #2:

 ***“Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Know that $\sqrt{2}$ is irrational. (a) evaluate square roots of perfect squares less than or equal to 225. (b) Evaluate cube roots of perfect cubes less than or equal to 1000.”***

Practice:

4. Simplify $\sqrt{\frac{25}{144}}$

a. $\frac{5}{12}$

b. $\frac{1}{6}$

c. $\frac{1}{2}$

d. $\frac{3}{4}$

5. Simplify $\sqrt[3]{x} + \sqrt[4]{y}$ when $x = 27$ and $y = 16$

a. 13

b. 10

c. 5

d. 17

6. Mike is building a cube-shaped Hope Chest for his daughter who is getting married this summer. The total volume of the box is 125 feet cubed. What are the dimensions of each side of the Hope Chest?

a. 15 feet

b. 5 feet

c. 25 feet

d. 10 feet

7. Sue wants to lay a square mat under her weight set to protect the floor. If the area of the mat is 36 feet squared, what is the length of the side?

Learning Objective # 3:

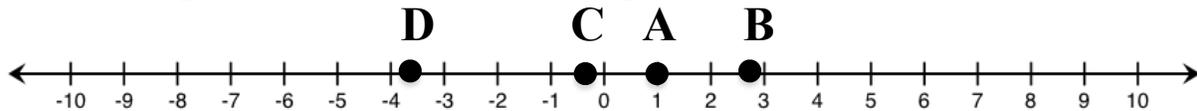
 ***“Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram, and estimate the values.”***

Practice:

8. $\sqrt{50}$ is between _____ and _____.

9. $\sqrt{130}$ is between _____ and _____.

Identify the point closest to the following numbers:



10. 275% _____

11. $-\frac{6}{16}$ _____

12. 15^0 _____

13. $-\sqrt{12}$ _____

Learning Objective #4:



“Fluently solve linear equations and inequalities with one variable.”

Practice:

14. From the given equation, determine which line holds the error.

Equation: $118 + x = 4(22 - x)$

Line 1: $118 + x = 88 - 4x$

Line 2: $118 = 88 - 5x$

Line 3: $30 = -5x$

Line 4: $x = -6$

- a. Line 1: $-4x$ is an incorrect simplification
- b. Line 2: $-5x$ is an incorrect simplification
- c. Line 3: 30 is an incorrect simplification
- d. There are no errors in the problem.

15. Solve $2(x - 8) = 6(2x - 12)$

16. Solve $2(x - 7) > -x + 13$

17. Solve & Graph. $-2 < 4p + 6 + 4$

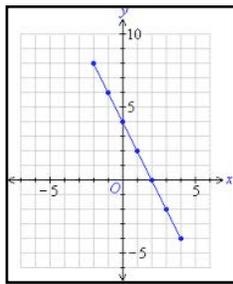
Learning Objective #5:

 **“Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.”**

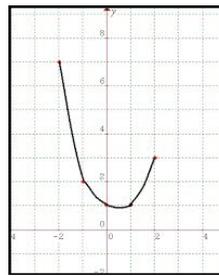
Practice:

18. The graph of a linear function is a _____?
- a. parabola
 - b. asymptote
 - c. curve
 - d. line
19. Which scenario does not represent a linear function?
- a. A phone plan costs \$50 a month and \$.25 per text.
 - b. Jon rents a Rug Doctor it costs \$30 plus \$5 for every day it is late.
 - c. You buy a printer for \$100 and the ink cartridges cost \$25 each.
 - d. A baseball is hit into the air at a speed of 90 mph. The equation for the ball's height is $f(x) = -5x^2 + 38.7x + 25.5$

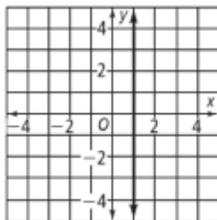
Identify each graph as a linear or nonlinear function.



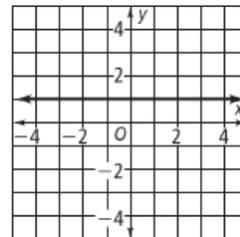
20. _____



21. _____



22. _____



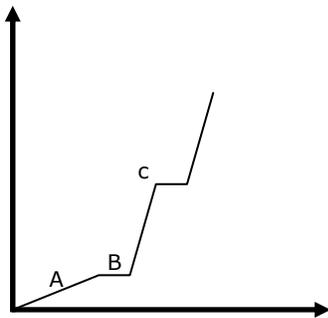
23. _____

Learning Objective #6:

 *“Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.”*

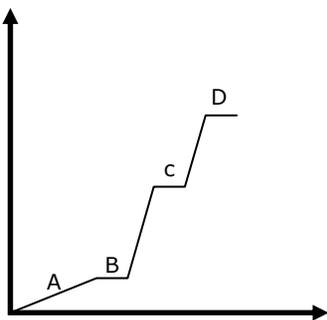
Practice:

24. The graph below represents Michael going to the playground. First, he walks to church. He stays there for few minutes. Then he hires a taxi to drive him to the playground. The taxi stops at a coffee shop and then the playground. In the graph, which part represents Michael waiting for the taxi driver to pick him up?



- a. Part A
- b. Part B
- c. Part C

25. Isabella is a plumber. She walks to the market. She buys some tools and stays there a few minutes. Then she hires a taxi to go to Sarah’s house. After Sarah’s she takes the taxi to Olivia’s house. The graph below represents her trip to Olivia’s house. Which part of the graph represents Isabella’s taxi ride to Sarah’s



- a. Between Part A & B
- b. Between Part B & Part C
- c. Between Part C & D
- d. Between Part B & D

26. What part of the graph represents Isabella’s time shopping at the market?

- a. Part A
- b. Part B
- c. Part C
- d. Part D

Benchmark 1 Essential Math Vocabulary

- ◆ **angle** - a geometric figure consisting of the union of two rays that share a common endpoint (vertex).
- ◆ **degree** (geometry) - a unit of measure based on dividing a circle into 360 equal parts, and used to measure angles, arcs, and rotations.
- ◆ **parallel lines** - two lines on the same plane that do not meet and are equal distance apart.
- ◆ **transversal** - a line that cuts through two or more lines (usually parallel)
- ◆ **alternate angles** - angles formed on different sides of a transversal.
- ◆ **interior angle** - angles formed on the insides of two lines cut by a transversal.
- ◆ **exterior angle** - angles formed on the outsides of two lines cut by a transversal.
- ◆ **complementary angles** - two angles whose sum equals 90 degrees.
- ◆ **supplementary angles** - two angles whose sum equals 180 degrees.
- ◆ **vertical angles** - one of two opposite and equal angles formed by the intersection of two lines.
- ◆ **corresponding angles** - the angles that occupy the same relative position at each intersection where a straight line crosses two others.
- ◆ **congruent** - same shape and same size; equal
- ◆ **exponent** - a number that says how many times to use that number in a multiplication. It is written as a small number to the right and above the base number.
- ◆ **radical** - the symbol that is used to indicate square roots, cube roots, etc.
- ◆ **square root** - one of the two equal factors of a number.
- ◆ **cube root** - one of only three factors of a given number.
- ◆ **irrational number** - any real number that cannot be expressed as a ratio between two integers.
- ◆ **order** - arranging numbers in a well-defined manner.
- ◆ **compare** - estimate, measure, or note the similarity or dissimilarity between values.

Benchmark 1 Essential Math Vocabulary

- ◆ **simplify** - reduce to lowest terms.
- ◆ **evaluate** - to find the numerical value of a mathematical expression.
- ◆ **estimate** - to form an approximate idea; calculate roughly.
- ◆ **equation** - a statement that the values of two mathematical expressions are equal.
- ◆ **inequality** - a mathematical statement that says two expressions are not equal.
- ◆ **combine** - to add two or more numbers or like terms into one as a way of simplifying an expression.
- ◆ **like terms** - algebraic expressions in which variables and exponents are the same.
- ◆ **distributive property** - the multiplication of a sum by multiplying each addend separately and then adding the products.
- ◆ **linear equation** - an equation in which the highest power of any variable is one and when graphed forms a straight line.
- ◆ **function** - a rule that defines a relationship between two sets of numbers in that for each value of the independent variable set there is only one value in the dependent variable set.
- ◆ **linear function** - a function that has a constant rate of change and can be modeled by a straight line.
- ◆ **nonlinear function** - a function that cannot be modeled as a straight line.
- ◆ **slope-intercept form** - a written form of a linear equation, $y = mx + b$, where m is the slope and b is the y-intercept.
- ◆ **slope** - the measure of steepness of a line; represented by “ m ” in slope-intercept form.
- ◆ **y-intercept** - the coordinate at which the graph of a line intersects the y-axis.
- ◆ **graph** - to draw a representation of a given mathematical function.
- ◆ **analyze** - to examine something by separating it into smaller parts and determining the relationship between the parts.

Math ANSWER KEY

1. D
2. B
3. 65° - Corresponding angles are congruent
4. A
5. C
6. B
7. 6 feet
8. 7 & 8
9. 11 & 12
10. B
11. C
12. A
13. D
14. D
15. $x = -8.8$
16. $x > 9$
17. $p > -3$ or $-3 < p$



18. D
19. D
20. linear
21. nonlinear
22. nonlinear
23. linear
24. B
25. B
26. B