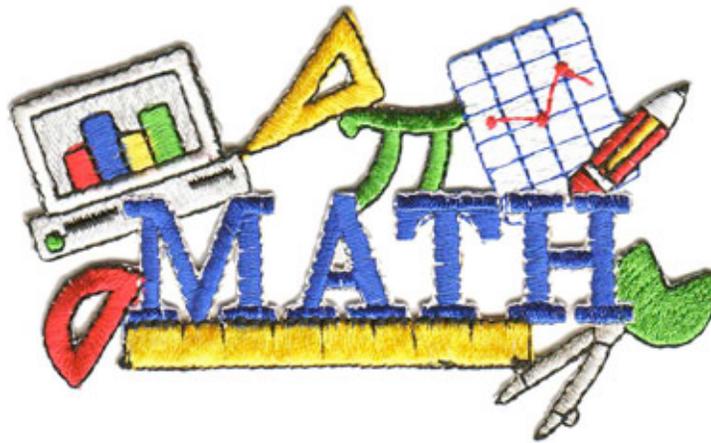# 7th Grade Math

Benchmark 2

Parent Handbook

This handbook will help your child review material learned this quarter, and will help them prepare for their second Math 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.

Seventh Grade Benchmark #2
Math Essential Standards

Learning Objective #1:

📌 **"Use proportional relationships to solve multi-step ratio and percent problems."**

Practice:

1. Your friend goes to the store and buys a soda for $1.50, a cookie for $1.00, and a bag of pretzels for $2.10. An additional 9% sales tax is added to the bill. What is the total cost?

     a. $4.60
     b. $5.01
     c. $5.14
     d. $0.41

2. Jane refurbishes old furniture and sells it for a profit. She recently bought an antique bench for $230. After sanding and resurfacing, she hopes to sell it for 25% more than she purchased it. What would be her profit after selling the bench?

     a. $287.50
     b. $57.00
     c. $57.50
     d. $172.50

3. Kris buys a new polo that was on sale for 45% off. He only paid $13.00. What was the original price of the polo?

     a. $23.64
     b. $5.85
     c. $7.15
     d. $28.89

4. Leah goes to Buffalo Wild Wings for lunch. Her total bill was $35.50. She wants to leave a tip that is 18% of the total bill. How much should she leave for the server? How much did she spend in all?

    _____

Learning Objective #2:

"**Recognize and represent proportional relationships between quantities.**"

Practice:

5. A climber is on a hike. After 2 hours he is at an altitude of 400 feet. After 6 hours he is at an altitude of 700 feet. What is the average rate of change?
        a. 200 feet per hour
        b. 150 feet per hour
        c. 75 feet per hour
        d. 117 feet per hour

6. A chef cooks 12 lbs of beef for 60 people and 18 lbs of beef for 90 people. Find the rate of change.
        a. 5 lbs of beef per person
        b. 1 lb of beef per 6 people
        c. 6 lbs of beef per person
        d. 1 lb of beef per 5 people

7. Annie earns $320 for 8 hours of work. At that rate, how long would she have to work to earn $1,120?
        a. 28 hours
        b. 40 hours
        c. 140 hours
        d. 100 hours

8. Find the rate of change for the following table:

_____

Time (min)	Distance (miles)
15	1
45	3
75	5
105	7

Learning Objective # 3:

"Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale."

Practice:

Use the table and scale below to answer questions 9 & 10.

Location	Map Distance	Actual Distance
Math Class to Office	6 cm	
Office to Nurse	2 cm	
Nurse to Library	9.5 cm	
Library to Lunch	5 cm	
Scale: 3 centimeters = 15 feet		

9. What is the actual distance from the library to lunch?
    a. 15 feet
    b. 25 feet
    c. 20 feet
    d. 30 feet

10. What is the actual distance from math class to the library if you have to follow the path shown above in the table?
    a. 87.5 feet
   b. 80 feet
    c. 45 feet
    d. 90 feet

11. Next weekend you are going to go hiking at Sabino Canyon. On the trail map you notice that it says that 1.5 centimeters equals 2 miles. If Telephone Line Trail is 9 centimeters on the map, how far is it in real life?

Learning Objective #4:

 📌 **"Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure."**
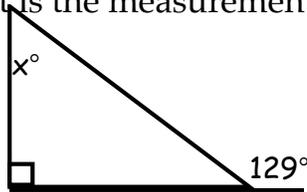
Practice:

Use the diagram to answer questions 12 & 13.
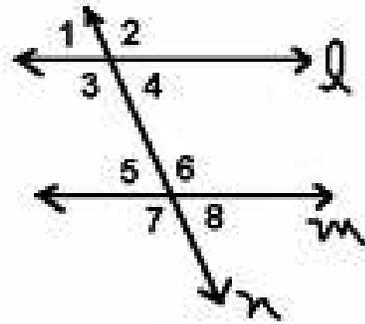
12. $\angle 2$ and $\angle 6$ are _____ angles.
     a. vertical angles
     b. exterior angles
     c. interior angles
     d. corresponding angles

13. If $\angle 1$ measure 60°, what does $\angle 4$ measure?
     a. 120°
     b. 60°
     c. 30°
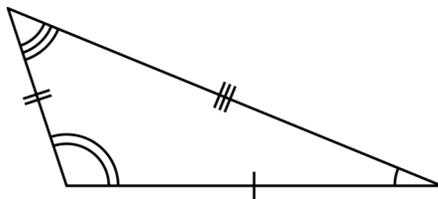   d. 90°

14. What is the measurement of $\angle x$?

     a. 39°
     b. 51°
     c. 49°
     d. 59°

Learning Objective #5:

"Draw geometric shapes with given conditions using a variety of methods. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle."

Practice:

15. Name this sh

      a. isosceles triangle
      b. right triangle
      c. scalene triangle
      d. acute triangle

16. Which type of triangle has three congruent angles? What does each angle measure?

_____

_____

17. Which of the following lengths will NOT create a triangle?
      a. 16 cm, 9 cm, 9 cm
      b. 3 ft, 7 ft, 5 ft
      c. 2 cm, 2 cm, 2 cm
      d. 7 cm, 9 cm, 20 cm

Learning Objective #6:

"Understand and use the formulas for the area and circumference of a circle to solve problems; give an informal derivation of the relationship between the circumference and area of a circle."

Practice:

18. The diameter of the Starbucks venti (large) lid is 3.3 inches. The tall (small) has a diameter of 2.6 inches. What is the difference in the circumference of the two cups?
    a. 2.198 inches
    b. 10.362 inches
    c. 8.164 inches
    d. 11.464 inches

19. The radius of the white circle is 4 cm and the radius of the grey circle is an additional 3 cm. What is the are   n only?
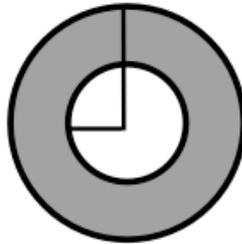
    a. 28.26 sq. cm
    b. 21.98 sq. cm
    c. 103.62 sq. cm
    d. 9.42 sq. cm

20. The distance around a carousel is 21.98 yards. What is the radius?
    a. 5 yards
    b. 3.5 yards
    c. 4 yards
    d. 7 yards

Benchmark 2 Essential Math Vocabulary

✦ **ratio -** a comparison of two quantities by division that can be expressed as a to b, a/b, or a:b.

✦ **proportion -** the statement of equality between two ratios.

✦ **percent -** a ratio that compares a number to 100; (%).

✦ **tax -** a mandatory contribution to state revenue charged by the government on workers' compensation, and business profits, or added to the cost of some goods, services, or transactions.

✦ **discount -** an amount that is subtracted from the regular price of an item.

✦ **unit rate -** is the ratio of two measurements in which the second term or quantity is one. (e.g., 30 miles per 1 gallon, 6 feet per 1 second).

✦ **slope -** the measure of steepness of a line; represented by "m" in y-intercept form.

✦ **change over time -** slope is often expressed as a rate that changes over time. (e.g. weight gain over a year, growth over months.)

✦ **scale factor -** the ratio of any two corresponding measurements (i.e. lengths) in two similar geometric figures.

✦ **angle -** a figure formed by two rays with a common endpoint or vertex.

✦ **supplementary angles -** two angles whose measures have a sum of 180 degrees.

✦ **complementary angles -** two angles whose measures have a sum of 90 degrees.

✦ **right angle -** an angle that has a measure of 90 degrees.

✦ **straight angle -** an angle whose measure is 180 degrees.

✦ **corresponding angles -** the angles that occupy the same relative position at each intersection where a straight line crosses two others.

Benchmark 2 Essential Math Vocabulary

✦ **vertical angles -** one of two opposite and equal angles formed by the intersection of two lines.

✦ **interior angles -** the angles formed inside the parallel lines when two parallel lines are cut by a third line (transversal).

✦ **exterior angles -** the angles formed outside the parallel lines when two parallel lines are cut by a third line (transversal).

✦ **polygon -** a closed plane figure formed by two or more line segments.

✦ **equilateral triangle -** a triangle with three congruent sides.

✦ **isosceles triangle -** a triangle with exactly two congruent sides.

✦ **scalene triangle -** a triangle with no congruent sides.

✦ **circumference -** the complete distance around a circle; The formula to calculate the circumference of a circle is: $C = \prod d$ OR $C = 2\prod r$

✦ **area -** the number of square units that covers a given surface, or the amount of space inside a polygon. The formula to calculate the area of a circle is: $A = \prod r^2$

✦ **diameter -** is a line segment that passes through the center of a circle with both endpoints lying on the circle.

✦ **radius -** is the distance (line segment) from the center of a circle to any point on the circle.

✦ **formula -** is an expression or equation that expresses a relationship between certain quantities.

✦ **pi ($\prod$) -** is the ratio of the circumference of a circle to its diameter and is usually estimated as 3.14.

Math ANSWER KEY

1. B
2. C
3. A
4. Tip is $6.39 and the Total is $41.89
5. C
6. D
7. A
8. 1 miles per 15 minutes
9. B
10. A
11. 12 miles
12. D
13. B
14. A
15. C
16. equilateral triangle; 60°
17. D
18. A
19. C
20. B