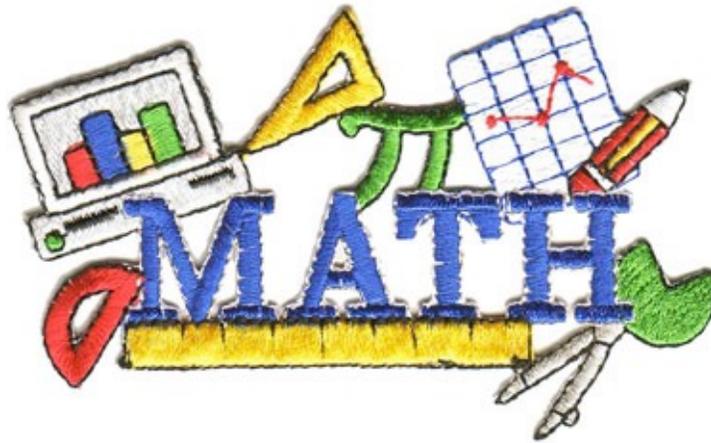


8th Grade Math

Benchmark 3

Parent Handbook



This handbook will help your child review material learned this quarter, and will help them prepare for their third 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 #3

Math Essential Standards

Learning Objective #1:

 "I can use the properties of exponents to simplify numerical expressions."

Practice:

1. Simplify the following expression: $4^3 \cdot 5^3$

- a. 180
- b. 8000
- c. 400
- d. 4000

2. Simplify the following expression: $5^{-2} \cdot 5^4$

- a. 125
- b. 625
- c. 25
- d. -25

3. Simplify the following expression: $\frac{4^4}{4^2}$

- a. 4
- b. 16
- c. $\frac{1}{4}$
- d. -16

4. Simplify the following expression: a^{-4}

Learning Objective #2:

 **“I can convert decimal forms to scientific notation and apply rules of exponents to simplify expressions. I can recognize scientific notation that has been generated by technology.”**

Practice:

5. Convert to scientific notation: 97 million

- a. 9.7×10^7
- b. 97×10^7
- c. 9.7×10^6
- d. 97×10^6

6. Convert to scientific notation: 0.000000089

- a. 8.9×10^{-7}
- b. 8.9×10^7
- c. 8.9×10^8
- d. 8.9×10^{-8}

7. Convert to standard notation: 6.3×10^{-5}

- a. 6,300,000
- b. 630,000
- c. 0.000063
- d. 0.0000063

8. Convert to standard notation: 5.01×10^6

- a. 501,000,000
- b. 5,010,000
- c. 5,000,000
- d. 0.00000501

9. Multiply and answer in scientific notation: $(2.5 \times 10^7)(2 \times 10^3)$

Learning Objective # 3:

 **“I can analyze and solve pairs of linear equations.”**

Practice:

10. How many solutions would the following system of equations have:

$$2y = 2x + 4$$

$$4y = 4x - 16$$

- a. no solution
- b. one solution
- c. infinite solutions

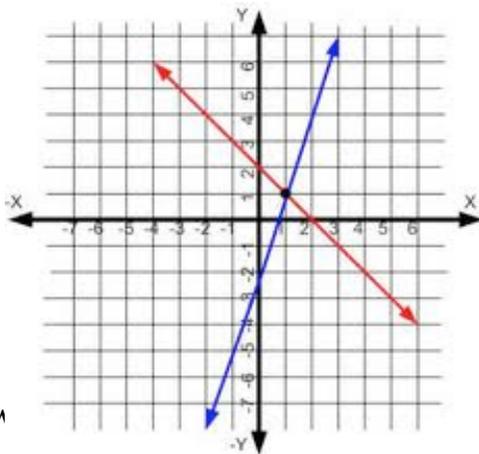
11. How many solutions would the following system of equations have:

$$y = 7x - 21$$

$$2x + 3y = 9$$

- a. no solution
- b. one solution
- c. infinite solutions

12. Using the graph below, what is the solution for the system of equations?



- a. (0, 2)
- b. (0, -2)
- c. (2, 0)
- d. (1, 1)

13. V

n of equations:

$$y - 2x = 16$$

$$2y + 4x = 12$$

Learning Objective #4:



"I can use the Pythagorean Theorem to solve problems."

Practice:

14. The bottom of a ladder must be placed 3 feet from a wall. The ladder is 12 ft. long. About how far above the ground does the ladder touch the wall?

- a. 12.4 feet
- b. 10 feet
- c. 11.6 feet
- d. 15 feet

15. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?

- a. 6.4 miles
- b. 9.4 miles
- c. 2.5 miles
- d. 94 miles

16. A soccer field is a rectangle 90 meters wide and 120 meters long. If you were asked to run from one corner to the other corner diagonally across, what is the distance?

- a. 150 meters
- b. 1500 meters
- c. 15 meters
- d. 200 meters

17. An isosceles triangle has congruent sides of 20 cm. The base is 10 cm. Estimate the height of the triangle to the nearest tenth of a centimeter.

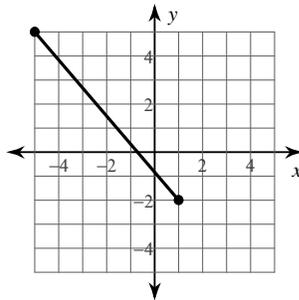
Learning Objective #5:



"I can use the Pythagorean Theorem to find the distance between two points."

Practice:

18. Find the distance between the two points on the graph. Round to the nearest tenth if necessary.

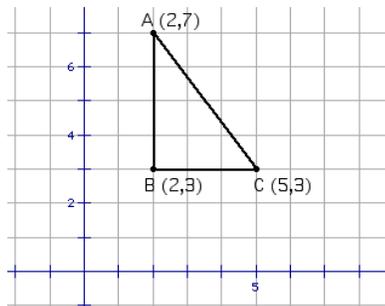


- a. 10
- b. 9.2
- c. 7
- d. 7.5

19. Find the distance between the two points $(5, 9)$, $(-7, -7)$. Round to the nearest tenth if necessary.

- a. 12
- b. 11.5
- c. 20
- d. 16

20. What is the distance of \overline{AC} ? Round to the nearest tenth if necessary.



Benchmark 3 Essential Math Vocabulary

- ◆ **exponent** - a number placed to the right of and above a non-zero base that indicates how many times the base is used as a repeating factor; a zero exponent is equal to one.
- ◆ **expression** - a mathematical phrase containing one or more terms linked by operation symbols.
- ◆ **scientific notation** - a form of writing a number expressed as a power of 10 and a decimal number greater than or equal to one and less than ten.
- ◆ **standard notation** - a number written with one digit for each place value in base ten.
- ◆ **simplify** - reduce to lowest terms.
- ◆ **system of equations** - is a set of two or more equations with the same variables graphed on the same coordinate plane. The intersection of the lines from the two equations is the solution that solves the system of equations.
- ◆ **parallel lines** - are distinct lines lying in the same plane that never intersect each other and have the same slope.
- ◆ **infinite solutions** - when an equation has all real numbers as its solution.
- ◆ **coincident lines** - two lines or shapes that lie exactly on top of each other.
- ◆ **linear combination** - a sum of products of each quantity times a constant.
- ◆ **point of intersection** - lines cross or intersect at exactly one point. This point gives the solution for the system of equations.
- ◆ **collinear** - three or more points that lie on the same straight line.
- ◆ **pythagorean theorem** - the statement that in a right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse ($a^2+b^2=c^2$).
- ◆ **right triangle** - a triangle that contains a 90 degree angle.
- ◆ **hypotenuse** - the longest of three sides of a right triangle; the side opposite the right angle in a right triangle.
- ◆ **leg of a triangle** - either of the two shorter sides of a right triangle. These two sides together form the right angle in the right triangle.
- ◆ **square (exponent)** - the result of multiplying a number by itself.
- ◆ **square root** - one of two equal factors of a number.

Benchmark 3 Essential Math Vocabulary

- ◆ **distance formula** - the distance formula is used to determine the distance, d , between two points. If the coordinates of the two points are (x_1, y_1) and (x_2, y_2) , the distance formula is $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- ◆ coordinate plane - A plane formed by the intersection of a horizontal number line called the x-axis and a vertical number line called the y-axis.
- ◆ **coordinate points** - A pair of numbers that describe the position of a point on a coordinate plane by using the horizontal and vertical distances from the two reference axes.

Math ANSWER KEY

1. B
2. C
3. B
4. $\frac{1}{a^4}$
5. A
6. D
7. C
8. B
9. 5×10^{10}
10. A
11. B
12. D
13. $(-2.5, 11)$
14. C
15. B
16. A
17. 19.4 cm
18. B
19. C
20. 5