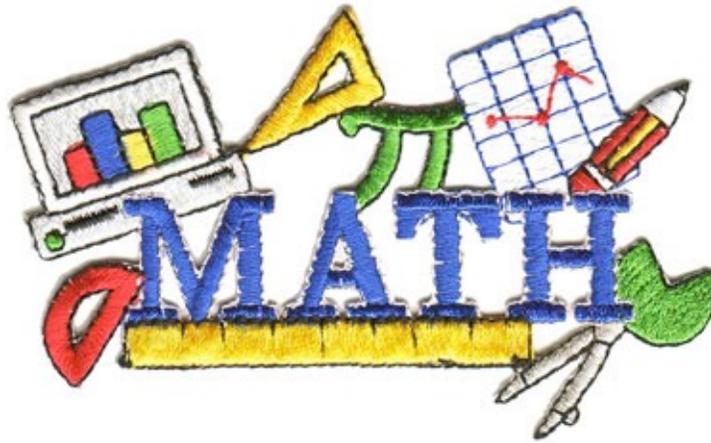


6th Grade Math

Benchmark 2

Parent Handbook



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

Sixth Grade Benchmark #2

Math Essential Standards

Learning Objective #1:

 **“Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.”**

Practice:

1. Joseph is on the football team. In yesterday’s game he ran for a 5 yard gain. On the next play, unfortunately, he was tackled behind the line of scrimmage for a 6 yard loss. Then, on the very next play he ran for a 12 yard gain. What was Joseph’s overall loss or gain?

- a. 11 yard loss
- b. 23 yard gain
- c. 11 yard gain
- d. 23 yard loss

2. Ryan was in a submarine that was coasting 30 feet below the surface of the water. It descended another 25 feet and then rose 13 feet. What was the location of Ryan’s submarine then?

- a. 68 feet below the surface
- b. 55 feet below the surface
- c. 38 feet below the surface
- d. 42 feet below the surface

3. While Savanna was eating breakfast, she checked the thermometer and it said -3° . By the time she arrived at school, the temperature was 9° . How many degrees did the temperature rise between breakfast and her arrival at school?

- a. 6°
- b. 12°
- c. -6°
- d. -12°

Learning Objective #2:

 **“Write, read, and evaluate algebraic expressions.”**

Practice:

4. What is the value of $6y - 3x$ when $x = 1.2$ and $y = 0.3$?
- a. -1.8
 - b. 1.8
 - c. 5.4
 - d. -5.4
5. Evaluate the algebraic expression $7r + 10 - r^2$ when $r = 4$.
- a. -12
 - b. 54
 - c. 30
 - d. 22
6. Christy and Becky went apple picking. Christy picked $\frac{1}{4}$ the amount of apples that Becky picked. If Becky picked 124 apples, how many did Christy pick?
- a. 31 apples
 - b. 62 apples
 - c. 496 apples
 - d. 93 apples
7. Choose the correct algebraic expression to represent “ten less than 3 times a number”.
- a. $10 - 3x$
 - b. $3x - 10$
 - c. $(3 + x) - 10$
 - d. $10 - (3 + x)$
8. What is the coefficient in the expression from Question #7?
- _____

Learning Objective #3:

 **"Understand solving an equation or inequality as a process of reasoning to find the value(s) of the variables that make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true."**

Practice:

9. What is the solution for $\frac{2}{3}n = 12$?

- a. 36
- b. 8
- c. 18
- d. 24

10. Solve $20 + 5x = 55$.

- a. 15
- b. 7
- c. 12
- d. 25

11. Samantha had \$620 in her savings. She wanted to have at least \$200 in her account after her five days in San Diego. Write an inequality to show how much she can spend each day.

12. Solve the inequality from Question #11 to find out how much Samantha can spend each day.

Learning Objective #4:

 **“Solve mathematical problems and problems in real- world context by writing and solving equations in the form $x+p=q$, $x-p=q$, $px=q$, and $x/ p=q$ for cases in which p , q , and x are all non-negative rational numbers.”**

Practice:

13. Which operation is used to find the solution to the following equation:

$$x - 12 = 37?$$

- a. Subtract 12 from each side
- b. Add 12 to each side
- c. Subtract 37 from each side
- d. Add 37 to each side

14. Which operation is used to find the solution to the following equation:

$$3x = 42?$$

- a. Multiply each side by 3
- b. Multiply each side by 42
- c. Divide each side by 3
- d. Divide each side by 42

15. For which equation is $x = 5$ a solution? Circle all the apply.

- a. $4 + x = 20$
- b. $x + 10 = 15$
- c. $5x = 35$
- d. $15 - x = 5$
- e. $4x = 20$

16. There are 21 yards total that need to be mowed in Dominic’s neighborhood. He mowed 8 yards this month. How many more yards does Dominic have to mow? Write an equation and solve.

Equation _____

Solution _____

Learning Objective #5:

 **“Write an inequality of the form $x > c$, $x < c$, $x \geq c$, or $x \leq c$ to represent a constraint or condition to solve mathematical problems and problems in real- world context. Recognize that inequalities have infinitely many solutions; represent solutions of such inequalities on number lines.”**

Practice:

17. Which inequality is represented in the graph below?



- a. $x < 50,000$
- b. $x \leq 50,000$
- c. $x \geq 50,000$
- d. $x > 50,000$

18. Sally went to the Pima County Fair and found that she must be at least 48 inches tall to ride all the fast rides. Which inequality represents this situation?

- a. $x \geq 48$
- b. $x > 48$
- c. $x \leq 48$
- d. $x < 48$

Translate each phrase into an inequality (write it on the line) and then graph.

19. 7 is greater than a number r.

20. You must be 8 years old or younger to play on the trampoline.

Learning Objective # 6:

 **“Understand ordering and absolute value of rational numbers.”**

Practice:

21. What is the value of $|-12|$?

- a. 12
- b. -12
- c. 21
- d. 0

22. Which number is left of -5 on the number line?

- a. 0
- b. -3.5
- c. 7
- d. -7

23. Choose the series of rational numbers that is in order from least to greatest.

- a. $-5.5, -\frac{22}{10}, 0, \frac{1}{2}, 4$
- b. $4, \frac{1}{2}, 0, -\frac{22}{10}, -5.5$
- c. $-7.3, -\frac{24}{5}, -12, \frac{4}{3}, 12.6$
- d. $12.6, \frac{4}{3}, -12, -\frac{24}{5}, -7.3$

Learning Objective #7:

 **“Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example the expressions $y+y+y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.”**

Practice:

24. What expression is NOT equivalent to $x^2 + 9$?

- a. $(x \cdot x) + (3 \cdot 3)$
- b. $(x + x) + 3^2$
- c. $(x \cdot x) + 3^2$
- d. $(x \cdot x) + (3 + 3 + 3)$

25. Simplify by combining like terms.

$$3a + 15 - 2a^2 + 5a^2 - 7 + 5a$$

- a. $a^2 + 11a + 8$
- b. $6a^2 + 8$
- c. $3a^2 + 8a + 8$
- d. $8a^2 - 2a + 22$

26. Simplify by combining like terms.

$$2(2a^2 - 4a + 3) + 3a^2 - 4a + 7$$

Benchmark 2 Essential Math Vocabulary

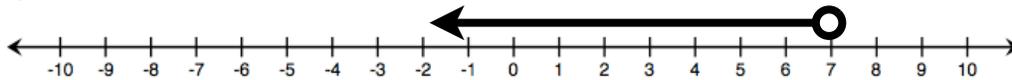
- ◆ **integer** - one of the set of whole numbers and their opposites.
- ◆ **rational number** - a number than can be expressed as a ratio which includes integers, fractions, and decimals.
- ◆ **number line** - a straight line, theoretically extending to infinity in both positive and negative directions from zero, that shows the relative order of the real numbers.
- ◆ **absolute value** - a number's distance from zero on a number line.
- ◆ **expressions** - a mathematical phrase containing one or more terms linked by operation symbols.
- ◆ **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.
- ◆ **equivalent** - denoting two quantities that have the same value.
- ◆ **evaluate** - to find the numerical value of a mathematical expression.
- ◆ **translate** - to find the equation or expression that contains the information in a word problem.
- ◆ **coefficient** - a number used to multiply a variable.
- ◆ **equation** - a mathematical sentence in which equivalent values are separated by an equal sign.
- ◆ **inequality** - a mathematical statement that says two expressions are not equal.
- ◆ **justify** - to show or prove that your answer is true and valid using logic and/or evidence.
- ◆ **solve** - to find the value(s) of a variable(s) that makes a mathematical sentence (equation) true.
- ◆ **inverse operation** - a related but opposite process.
- ◆ **graph** - to draw a representation of a given mathematical function.

Benchmark 2 Essential Math Vocabulary

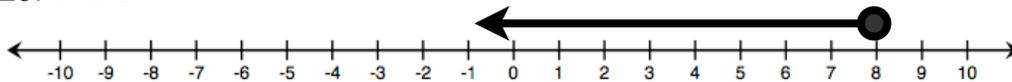
- ◆ **like terms** - algebraic expressions in which variables and exponents are the same.
- ◆ **variable** - a letter used to represent a number value in an expression or an equation.
- ◆ **distributive property** - the multiplication of a sum by multiplying each addend separately and then adding the products.
- ◆ **associative property** - the grouping of numbers undergoing the operation does not change the result.
- ◆ **commutative property** - the property in addition and multiplication that states the order in which two terms are added or multiplied does not change results.
- ◆ **combine** - to add two or more numbers or like terms into one as a way of simplifying an expression.
- ◆ **simplify** - reduce to lowest terms.

Math ANSWER KEY

1. C
2. D
3. B
4. A
5. D
6. A
7. B
8. 3
9. C
10. B
11. $5x \leq 620 - 200$
12. \$84 per day
13. B
14. C
15. B & E
16. $x + 8 = 21$; $x = 13$ yards
17. D
18. A
19. $r < 7$



20. $x \leq 8$



21. A
22. D
23. A
24. B
25. C
26. $7a^2 - 12a + 13$