Name:_____

MATH

Review Packet

for incoming

8th Grade Students

SARASOTA SUNCOAST ACADEMY

BULLS

Dear incoming 8th grader,

I hope you had a wonderful 7th grade year!

I have prepared this summer math packet to help you get ready for Pre-Algebra or Algebra. It covers many of the math topics that you learned in class this year, which we will be building on next year. Although everything in this packet is review, each topic includes a brief reteaching section (with an explanation and example) to help guide you, just in case you have forgotten how to do the problems.

Please show all of your work for every problem in the packet. You can show your work in the space provided for each question. If you need additional space for your work, be sure to number any problems you solve on extra paper and staple the extra paper(s) to your packet. The completed packet is due the first day of school (Monday, August 12,2024). It will count as your first grade of the new school year.

I hope you have a nice summer and I look forward to seeing you in August!

Sincerely,
Dan Cymbal

REVIEW: Evaluating Expressions

Name _____

Key Concept and Vocabulary

variable

Expression: $2x^2 + 3x - 6$

Evaluate when $x = 2$.

$$2(2^2) + 3(2) - 6 = 8 + 6 - 6$$
$$= 8$$

Visual Model

x	$2x + 3$	Value of Expression
1	$2(1) + 3$	5
2	$2(2) + 3$	7
3	$2(3) + 3$	9
4	$2(4) + 3$	11

Skill Examples

1. When $x = 5$, $3x + 4$ is $3(5) + 4 = 19$.
2. When $x = -1$, $5x + 7$ is $5(-1) + 7 = 2$.
3. When $x = 3$, $4x^2$ is $4(3^2) = 36$.
4. When $x = 4$, $x^3 + 1$ is $4^3 + 1 = 65$.

Application Example

5. For a Celsius temperature C the Fahrenheit temperature F is $\frac{9}{5}C + 32$. Find F when $C = 25°$.

$$\frac{9}{5}C + 32 = \frac{9}{5}(25) + 32$$
$$= 45 + 32$$
$$= 77$$

∴ The Fahrenheit temperature is 77°.

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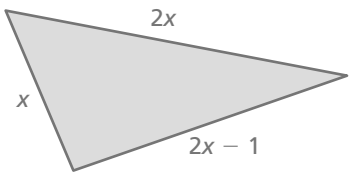
Check your answers at BigIdeasMath.com.

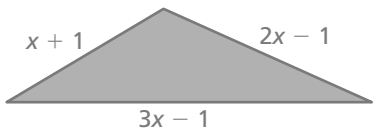
Evaluate the expression.

6. When $x = 2$, $3x - 1 =$ _____.
7. When $x = -1$, $3x + 9 =$ _____.
8. When $x = 4$, $x^2 - 5 =$ _____.
9. When $x = \frac{1}{2}$, $3x^2 =$ _____.
10. When $x = 3.1$, $5x + 0.5 =$ _____.
11. When $x = 0$, $4x^2 + 5 =$ _____.
12. When $x = 10$, $x^2 - 8x + 11 =$ _____.
13. When $x = 2\frac{1}{2}$, $6x + 3 =$ _____.

Evaluate the perimeter when $x = 3$.

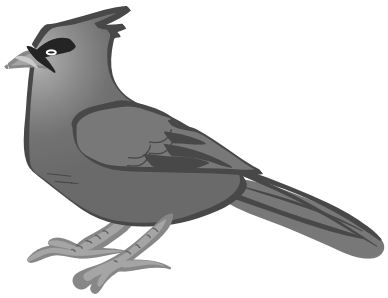
14. 

$P =$ _____

15. 

$P =$ _____

16. **CARDINAL** The weight of the cardinal (in ounces) is $0.6x + 11$ after its eats x ounces of bird seed. How much does it weigh after it eats 2 ounces of bird seed? _____



REVIEW: Simplifying Expressions

Name _____

Key Concept and Vocabulary

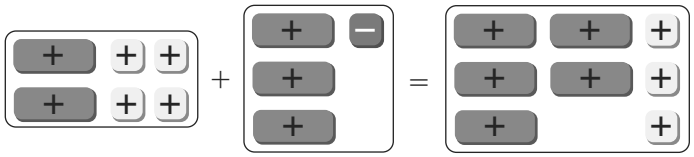
Combine variable terms.

$2x + 4 + 3x - 1 = 5x + 3$

Combine numerical terms.

Visual Model

Algebra Tiles



Skill Examples

1. $2x + 5x = 7x$
2. $1 + n + 4 = n + 5$
3. $(2x + 3) - (x + 2) = x + 1$
4. $2(y - 1) + 3(y + 2) = 5y + 4$

Application Example

5. The original cost of a shirt is x dollars. The shirt is on sale for 30% off. Write a simplifed expression for the sale cost.

$x - 0.3x = 0.7x$

∴ The sale cost is $0.7x$.

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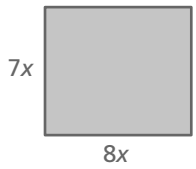
Check your answers at BigIdeasMath.com.

Simplify the expression. ***(Remove parentheses and combine like terms.)***

6. $4x + 6x =$ _____
7. $3n + 5 - 2n =$ _____
8. $9x + 3 - 6x - 2 =$ _____
9. $3(x + 2) =$ _____
10. $7m - 2m + 5m =$ _____
11. $2 - (x + 1) =$ _____
12. $(3x + 6) - x =$ _____
13. $5 - (1 - n) =$ _____
14. $(x + 6) - (x + 6) =$ _____
15. $(4x - 2) + 3(x + 1) =$ _____
16. $(5x + 4) - 2(x + 1) =$ _____
17. $5(x + 2) - 2(x + 2) =$ _____

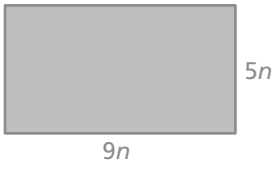
Write a simplified expression for the perimeter of the rectangle or triangle.

18.



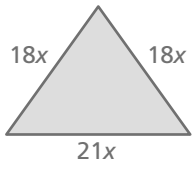
Perimeter = _____

19.



Perimeter = _____

20.



Perimeter = _____

21. The original cost of a cell phone is x dollars. The phone is on sale for 35% off. Write a simplified expression for the sale cost. _____

REVIEW: Writing Expressions and Equations

Name _____

Key Concept and Vocabulary

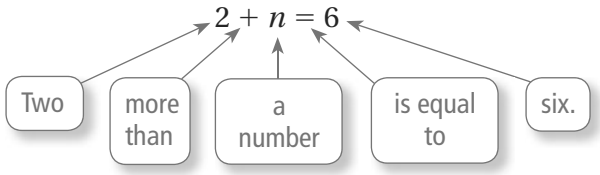
Phrase: Two more than a number

Expression: $2 + n$

Sentence: Two more than a number is equal to six.

Equation: $2 + n = 6$

Visual Model



Skill Examples

1. Five times a number: $5n$
2. Six less than three times a number: $3n - 6$
3. The sum of a number and one: $n + 1$
4. A number divided by three: $n \div 3$

Application Example

5. Write an equation for the following.
"The price of $15 is the wholesale cost plus a markup of fifty percent."

Let C be the wholesale cost.

50% of C is $0.5C$.

$\therefore$ An equation is $15 = C + 0.5C$.

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Check your answers at BigIdeasMath.com.

Write the verbal phrase as a mathematical expression.

6. The product of a number and two

_____

7. 10 subtracted from a number

_____

8. 19 less than twice a number

_____

9. The sum of a number and three, divided by four

_____

10. Five times the sum of a number and two

_____

11. Seven less than four times a number

_____

Write the sentence as an equation.

12. Three times a number equals nine.

_____

13. The difference of a number and nine is four.

_____

14. Twelve divided by a number is four.

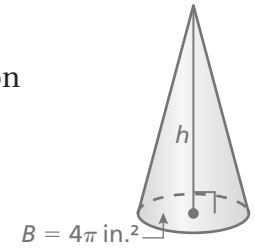
_____

15. The sum of a number and seven is eighteen.

_____

16. The volume of a cone is one-third the area of the base times the height. A cone has a volume of 20π cubic inches. Write an equation that can be used to solve for the height of the cone.

_____



REVIEW: Properties of Equality

Name _____

Key Concept and Vocabulary

Addition Property of Equality:

If $a = b$, then $a + c = b + c$.

Subtraction Property of Equality:

If $a = b$, then $a - c = b - c$.

Multiplication Property of Equality:

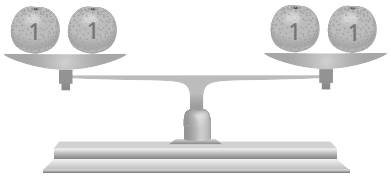
If $a = b$, then $a \cdot c = b \cdot c$.

Division Property of Equality:

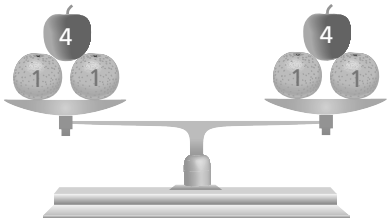
If $a = b$, then $a \div c = b \div c$, $c \neq 0$.

Visual Model

If two sides of a scale weigh the same, the scale balances.



If you add or subtract the same amount on each side of the scale, the scale still balances.



Skill Example

1. Solve $\frac{x}{4} - 3 = 7$.

$\frac{x}{4} - 3 = 7$	Write the equation.
$\underline{+3} \quad \underline{+3}$	Addition Property of Equality
$\frac{x}{4} = 10$	Simplify.
$\frac{x}{4} \cdot 4 = 10 \cdot 4$	Multiplication Property of Equality
$x = 40$	Simplify.

Application Example

2. Ski rental is \$45 for 3 hours and \$10 for each additional hour. You pay \$75. Write and solve an equation to find the number of additional hours you rented the skis.

$10h + 45 = 75$	Write the equation.
$\underline{-45} \quad \underline{-45}$	Subtraction Property of Equality
$10h = 30$	Simplify.
$\frac{10h}{10} = \frac{30}{10}$	Division Property of Equality
$h = 3$	Simplify.

∴ You rented the skis for 3 additional hours.

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Check your answers at BigIdeasMath.com.

Solve the equation. Identify the properties used.

3. $2y + 9 = 13$

$2y =$ _____ _____

$y =$ _____ _____

4. $\frac{n}{4} - 2 = 10$

$\frac{n}{4} =$ _____ _____

$n =$ _____ _____

5. COMPUTER You pay \$87 to get your computer repaired. You are charged \$37 for parts and \$20 per hour of labor. Write and solve an equation to find the number of labor hours you were charged. _____

Name _____ Date _____

Solving Linear Equations

To determine whether a value is a solution of an equation, substitute the value into the equation and simplify.

Example 1 **Determine whether (a) $x = 1$ or (b) $x = -2$ is a solution of $5x - 1 = 4$.**

a. $5x - 1 = -2x + 6$

$5(1) - 1 \stackrel{?}{=} -2(1) + 6$ Substitute.

$4 = 4$ ✓ Simplify.

▶ So, $x = 1$ is a solution.

b. $5x - 1 = -2x + 6$

$5(-2) - 1 \stackrel{?}{=} -2(-2) + 6$ Substitute.

$-11 \neq 10$ ✗ Simplify.

▶ So, $x = -2$ is *not* a solution.

To solve a linear equation, isolate the variable.

Example 2 **Solve each equation. Check your solution.**

a. $4x - 3 = 13$

$4x - 3 + 3 = 13 + 3$ Add 3.

$4x = 16$ Simplify.

$\frac{4x}{4} = \frac{16}{4}$ Divide by 4.

$x = 4$ Simplify.

Check

$4x - 3 = 13$

$4(4) - 3 \stackrel{?}{=} 13$

$13 = 13$ ✓

b. $2(y - 8) = y + 6$

$2y - 16 = y + 6$ Distributive Property

$2y - y - 16 = y - y + 6$ Subtract y.

$y - 16 = 6$ Simplify.

$y - 16 + 16 = 6 + 16$ Add 16.

$y = 22$ Simplify.

Check

$2(y - 8) = y + 6$

$2(22 - 8) \stackrel{?}{=} 22 + 6$

$28 = 28$ ✓

Practice

Check your answers at BigIdeasMath.com.

Determine whether (a) $x = -1$ or (b) $x = 3$ is a solution of the equation.

1. $5x + 7 = 2$

2. $-4x + 8 = -4$

3. $2x - 1 = 3x - 4$

Solve the equation. Check your solution.

4. $x - 9 = 24$

5. $n + 14 = 0$

6. $-16 = 4y$

7. $-\frac{5}{6}t = -15$

8. $81 = 46 - x$

9. $4x + 5 = 1$

10. $x + 5 = 11x$

11. $9(y - 3) = 45$

12. $6 = 7k + 8 - k$

13. $6n + 3 = -4n + 7$

14. $2c + 5 = 3(c - 8)$

15. $18m + 3(2m + 8) = 0$

16. $\frac{w - 6}{5} = 8$

17. $\frac{15 + h}{3} = 10$

18. $\frac{8 - 3x}{5} = x$

19. $(8r + 6) + (4r - 1) = 14$

20. $\frac{2}{3}y - 3 = 9$

21. $\frac{1}{2}x - \frac{3}{10} = \frac{5}{2}x + \frac{7}{10}$

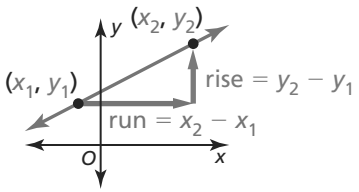
22. **MONEY** You have a total of \$3.25 in change made up of 25 pennies, 6 nickels, 2 dimes, and x quarters. How many quarters do you have?

Name _____ Date _____

Slope of a Line

The **slope** of a nonvertical line is the ratio of vertical change (*rise*) to horizontal change (*run*) between any two points on the line. If a line in the coordinate plane passes through points (x_1, y_1) and (x_2, y_2), then the slope m is

$$m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}.$$



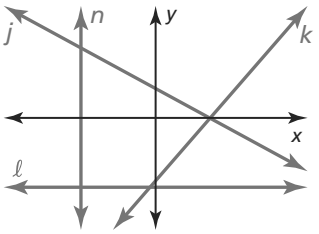
Slopes of Lines in the Coordinate Plane

Negative slope: falls from left to right, as in line j

Positive slope: rises from left to right, as in line k

Zero slope (slope of 0): horizontal, as in line ℓ

Undefined slope: vertical, as in line n



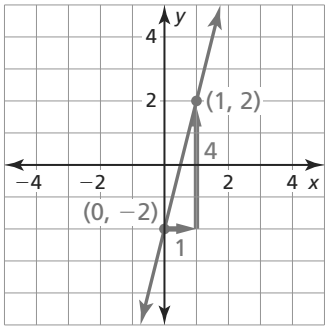
Example 1 **Find the slope of the line shown.**

Let $(x_1, y_1) = (0, -2)$ and $(x_2, y_2) = (1, 2)$.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$ Write formula for slope.

$$= \frac{2 - (-2)}{1 - 0}$$ Substitute.

$$= 4$$ Simplify.

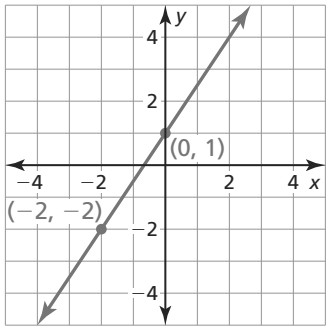


Practice

Check your answers at BigIdeasMath.com.

Find the slope of the line.

1.



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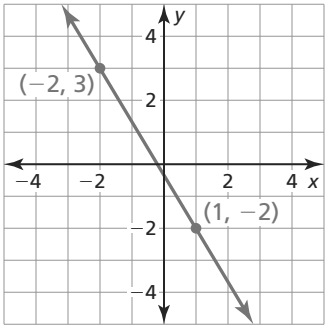

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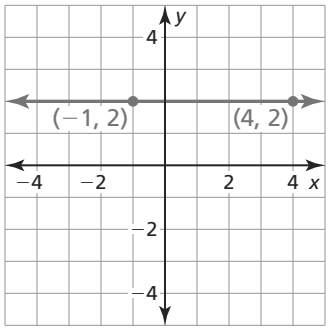


REVIEW: Linear Patterns

Name _____

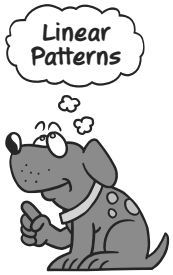
Key Concept and Vocabulary

Equation: $y = 2x + 3$

Table:

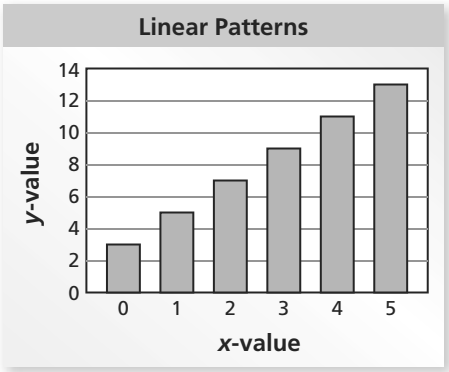
x	0	1	2	3	4	5
y	3	5	7	9	11	13

Words: Each time x increases by 1, y increases by 2.



Visual Model

Moving to the right, each bar increases by 2 units.



Skill Example

1. **Equation:** $y = 15 - 3x$

Table:

x	0	1	2	3	4	5
y	15	12	9	6	3	0

Words: Each time x increases by 1, y *decreases* by 3.

Application Example

2. The equation $P = 5t$ describes how much pay P you earn for working t hours. Make a table and describe the pattern.

t	1	2	3	4	5	6
P	5	10	15	20	25	30

∴ You get paid \$5 an hour.

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Complete the table. Then describe the pattern.

3. $y = x + 7$

x	0	1	2	3	4	5
y						

_____

_____

4. $y = 9 - x$

x	0	1	2	3	4	5
y						

_____

_____

5. $y = 4x + 5$

x	0	1	2	3	4	5
y						

_____

_____

6. $y = 90 - 6x$

x	0	1	2	3	4	5
y						

_____

_____

Write an equation for the pattern.

7.

x	0	1	2	3	4	5
y	5	14	23	32	41	50

_____

8.

x	0	1	2	3	4	5
y	50	40	30	20	10	0

_____

9. **HOURLY PAY** The equation $P = 7t$ describes how much pay P you earn for working t hours. Describe the pattern. _____

REVIEW: Function Rules

Name _____

Key Concept and Vocabulary

Function Rule: $y = 2x + 4$

output input

Words: Double the value of x and add 4 to get the value of y.

Visual Model

You can see how x and y compare by making an Input-Output table.

Function Rule: $y = 2x + 4$

Input, *x*	0	1	2	3	4	5
Output, *y*	4	6	8	10	12	14

Skill Example

1. Equation: $y = 20 - 4x$

Table:

Input, *x*	0	1	2	3	4	5
Output, *y*	20	16	12	8	4	0

Words: Multiply x by 4 and subtract from 20 to get the value of y.

Application Example

2. The equation $F = \frac{9}{5}C + 32$ describes how the Fahrenheit and Celsius scales relate. Describe this in words.

Input, *C*	0	5	10	15	20	25
Output, *F*	32	41	50	59	68	77

∴ Multiply C by $\frac{9}{5}$ and add 32 to get F.

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Check your answers at BigIdeasMath.com.

Complete the table. Then describe the pattern.

3. $y = 2x + 6$

Input, *x*	0	1	2	3	4	5
Output, *y*						

_____

_____

4. $y = 16 - 2x$

Input, *x*	0	1	2	3	4	5
Output, *y*						

_____

_____

5. $y = 3x + 7$

Input, *x*	0	1	2	3	4	5
Output, *y*						

_____

_____

6. $y = 65 - 10x$

Input, *x*	0	1	2	3	4	5
Output, *y*						

_____

_____

UNIT CONVERSION **Complete the table and describe the function rule in words.**

7. Inches to Centimeters: $C = 2.54I$

Input, *I*	0	1	2	3	4	5
Output, *C*						

_____

8. Miles to Kilometers: $K = 1.6M$

Input, *M*	0	1	2	3	4	5
Output, *K*						

_____

REVIEW: Properties of Exponents

Name _____

Key Concept and Vocabulary

Product of Powers Property:

$a^m \cdot a^n = a^{m+n}$

Power of a Power Property

$(a^m)^n \cdot a^{mn}$

Power of Quotient Property:

$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$, where $b \neq 0$

Zero Exponents

$a^0 = 1$, where $a \neq 0$

Quotient of Powers Property:

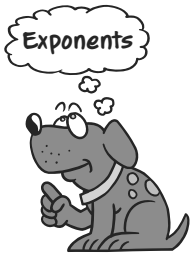
$\frac{a^m}{a^n} = a^{m-n}$, where $a \neq 0$

Power of a Product Property

$(ab)^m = a^m b^m$

Negative Exponents:

$a^{-n} = \frac{1}{a^n}$, where $a \neq 0$

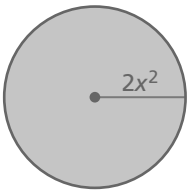


Skill Examples

1. $x^2 \cdot x^4 = x^{2+4} = x^6$
2. $(w^5)^3 = w^{5 \cdot 3} = w^{15}$
3. $\frac{y^6}{y^6} = y^{6-6} = y^0 = 1$
4. $\left(\frac{c}{2}\right)^3 = \frac{c^3}{2^3} = \frac{c^3}{8}$
5. $4g^{-3} = \frac{4}{g^3}$

Application Example

6. Write the area of the circle as a monomial.



Area $= \pi r^2$

$= \pi(2x^2)^2$

$= \pi(2^2)(x^2)^2$

$= 4\pi x^4$

∴ The area of the circle is $4\pi x^4$ square units.

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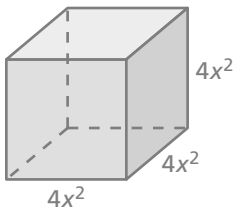
Simplify the expression using only positive exponents.

7. $\frac{v^7}{v^4} =$ _____
8. $(q^2)^5 =$ _____
9. $r^3 \cdot r^3 =$ _____
10. $(3h)^3 =$ _____
11. $\left(\frac{5}{x^2}\right)^2 =$ _____
12. $(2k^{-3})^2 =$ _____
13. **CUBE** Write the volume of the cube as a monomial.

$V =$ _____



REVIEW: Scientific Notation

Name _____

Key Concept and Vocabulary

A number is written in **scientific notation** when it is represented as the product of a factor and a power of 10. The factor must be at least 1 and less than 10.

The factor is at least 1 and less than 10. The power of 10 has an integer exponent.

6.3×10^5

Writing Numbers in Standard Form

When writing a number from scientific notation to standard form, the absolute value of the exponent tells you how many places to move the decimal point.

Negative exponent

Move the decimal point to the left.

$6.1 \times 10^{-3} = 0.0061$ (3)

Positive exponent

Move the decimal point to the right.

$2.75 \times 10^5 = 275{,}000$ (5)

Writing Numbers in Scientific Notation

Step 1: Move the decimal point to the right of the first nonzero digit.

Step 2: Count the number of places you moved the decimal point. This determines the exponent of the power of 10.

Number greater than or equal to 10

Use a positive exponent when you move the decimal point to the left.

$3400 = 3.4 \times 10^3$

Number between 0 and 1

Use a negative exponent when you move the decimal point to the right.

$0.00018 = 1.8 \times 10^{-4}$

Skill Examples

1. $1.66 \times 10^{-5} = 0.0000166$ (5)

2. $3.1 \times 10^6 = 3{,}100{,}000$ (6)

3. $0.033 = 3.3 \times 10^{-2}$ (2)

4. $2400 = 2.4 \times 10^3$ (3)

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Write the number in standard form.

5. $9.6 \times 10^7 =$ _____

6. $2 \times 10^{-6} =$ _____

7. $7.875 \times 10^4 =$ _____

8. $4.53 \times 10^{-4} =$ _____

9. $8.9 \times 10^{-7} =$ _____

10. $5.16 \times 10^8 =$ _____

Write the number in scientific notation.

11. $80{,}000{,}000 =$ _____

12. $0.00815 =$ _____

13. $8{,}135{,}000{,}000 =$ _____

14. $0.000051 =$ _____

15. $0.00000009 =$ _____

16. $1{,}784{,}000 =$ _____

REVIEW: Square Roots

Name _____

Key Concept and Vocabulary

A **square root** of a number is a number that when multiplied by itself, equals the given number. Every positive number has a positive *and* a negative square root. A **perfect square** is a number with integers as its square roots.

Positive Square Root: $\sqrt{9} = 3$

Negative Square Root: $-\sqrt{9} = -3$

Both Square Roots: $\pm\sqrt{9} = \pm 3$

Skill Examples

1. $\sqrt{36}$

∴ Because $6^2 = 36$, $\sqrt{36} = \sqrt{6^2} = 6$.

2. $-\sqrt{144}$

∴ Because $12^2 = 144$,

$-\sqrt{144} = -\sqrt{12^2} = -12$.

3. $\pm\sqrt{3.24}$

∴ Because $1.8^2 = 3.24$,

$\pm\sqrt{3.24} = \pm\sqrt{1.8^2} = 1.8$ and -1.8.

Application Example

4. The area of a square table top is 256 square inches. What is the length of one side of the table top?

$A = s^2$

$256 = s^2$

$\sqrt{256} = \sqrt{s^2}$

$16 = s$

∴ The length of one side of the table top is 16 inches.

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Check your answers at BigIdeasMath.com.

Find the square root(s).

5. $-\sqrt{64} =$ _____ **6.** $\sqrt{121} =$ _____ **7.** $\pm\sqrt{625} =$ _____ **8.** $\sqrt{4} =$ _____

9. $\pm\sqrt{289} =$ _____ **10.** $-\sqrt{196} =$ _____ **11.** $\sqrt{0.25} =$ _____ **12.** $-\sqrt{1.69} =$ _____

13. $\pm\sqrt{\frac{16}{49}} =$ _____ **14.** $-\sqrt{\frac{81}{100}} =$ _____ **15.** $\pm\sqrt{2.25} =$ _____ **16.** $\sqrt{\frac{9}{400}} =$ _____

Evaluate the expression.

17. $8\sqrt{9} - 5 =$ _____ **18.** $7 + 10\sqrt{\frac{1}{25}} =$ _____ **19.** $\sqrt{\frac{24}{6}} + 3 =$ _____

20. $6.2 + \sqrt{6.76} =$ _____ **21.** $7(\sqrt{400} - 9) =$ _____ **22.** $2\left(\sqrt{\frac{147}{3}} - 1\right) =$ _____

23. **ROOM** The area of the floor of a square room is 441 square feet. What is the length of one side of the floor of the room?

_____

REVIEW: Cubes

Name _____

Key Concept and Vocabulary

multiplication

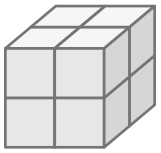
exponent

$2 \cdot 2 \cdot 2 = 2^3$

base

Visual Model

$2^3 =$



Skill Examples

1. $2^3 = 2 \cdot 2 \cdot 2 = 8$
2. $5^3 = 5 \cdot 5 \cdot 5 = 125$
3. $7^3 = 7 \cdot 7 \cdot 7 = 343$
4. $9^3 = 9 \cdot 9 \cdot 9 = 729$
5. $20^3 = 20 \cdot 20 \cdot 20 = 8000$

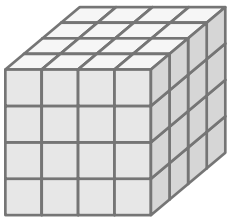
Application Example

6. How many small cubes are in the stack?

$4^3 = 4 \cdot 4 \cdot 4$

$= 64$

∴ 64 small cubes are in the stack.



PRACTICE MAKES *PURR*-FECT™

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Find the value.

7. $6^3 =$ _____
8. $3^3 =$ _____
9. $8^3 =$ _____
10. $10^3 =$ _____
11. $12^3 =$ _____
12. $15^3 =$ _____

Use an exponent to rewrite the expression.

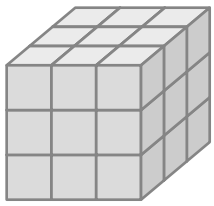
13. $16 \cdot 16 \cdot 16 =$ _____
14. $11 \cdot 11 \cdot 11 =$ _____
15. $25 \cdot 25 \cdot 25 =$ _____

Evaluate the expression when $x = 3$.

16. $x^3 + 1$ _____
17. $2x^3$ _____
18. $6x - x^3$ _____

How many small cubes are in the stack?

19.



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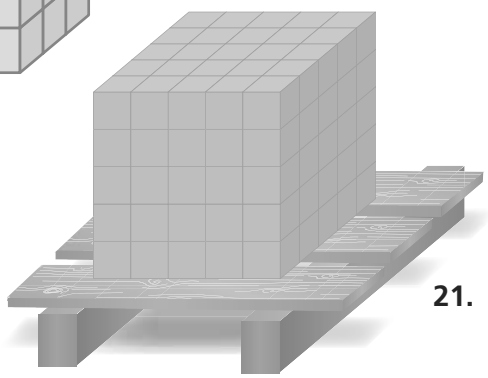
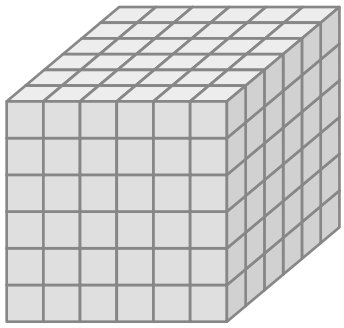


20.



_____

21. **SHIPPING** How many boxes are on the pallet?

_____

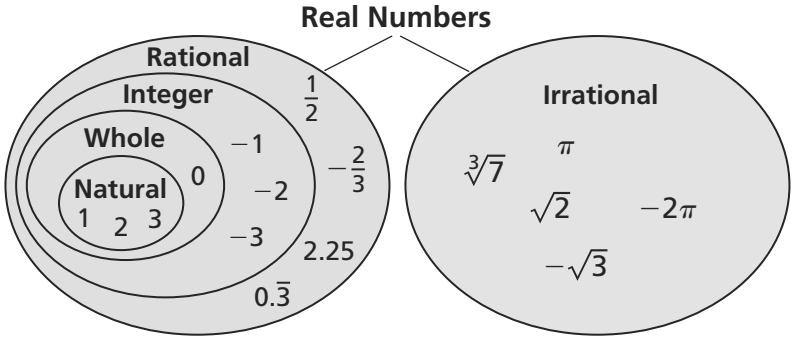
Name _____ Date _____

Classifying Real Numbers

A **rational number** is a number that can be written as the ratio of two integers. An **irrational number** cannot be written as the ratio of two integers.

- The square root of any whole number that is not a perfect square is irrational. The cube root of any integer that is not a perfect cube is irrational.
- The decimal form of an irrational number neither terminates nor repeats.

Rational numbers and irrational numbers together form the set of **real numbers**.



Example 1 **Classify each real number in as many ways as possible.**

	Number	Subset(s)	Reasoning
a.	$\sqrt{18}$	Irrational	18 is not a perfect square.
b.	$0.\overline{33}$	Rational	$0.\overline{33}$ is a repeating decimal.
c.	$-\sqrt{4}$	Integer, Rational	$-\sqrt{4}$ is equal to -2.
d.	$\frac{56}{7}$	Natural, Whole, Integer, Rational	$\frac{56}{7}$ is equal to 8.
e.	$\sqrt[3]{5}$	Irrational	5 is not a perfect cube.

Practice

Check your answers at BigIdeasMath.com.

Classify the real number in as many ways as possible.

1. $\sqrt{17}$ **2.** $\frac{1}{5}$ **3.** 0.25

4. $\frac{48}{6}$ **5.** $-\sqrt{25}$ **6.** $\sqrt[3]{32}$

Determine whether the statement is *always*, *sometimes*, or *never* true. Explain your reasoning.

7. A natural number is a whole number.

8. An integer is a natural number.

9. A natural number is negative.

10. A real number is an irrational number.

11. A rational number is a real number.

12. A whole number is an irrational number.

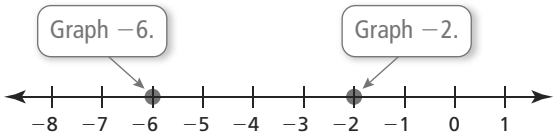
Name _____ Date _____

Comparing and Ordering Real Numbers

There are several ways to compare real numbers. One way is to write the numbers as decimals and use a number line.

Example 1 **Complete the statement with <, >, or =.**

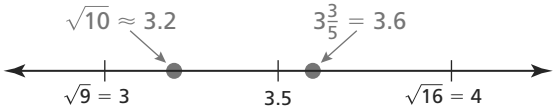
a. $-2 \square -6$



▶ -2 is to the right of -6. So, $-2 > -6$.

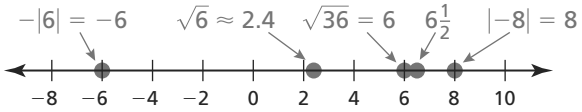
b. $\sqrt{10} \square 3\frac{3}{5}$

Estimate $\sqrt{10}$ to the nearest tenth. Then graph the numbers on a number line.



▶ $3\frac{3}{5}$ is to the right of $\sqrt{10}$. So, $\sqrt{10} < 3\frac{3}{5}$.

Example 2 **Order the values from least to greatest: $\sqrt{36}$, $|-8|$, $\sqrt{6}$, $6\frac{1}{2}$, $-|6|$.**



▶ So, the order from least to greatest is $-|6|$, $\sqrt{6}$, $\sqrt{36}$, $6\frac{1}{2}$, and $|-8|$.

Practice

Check your answers at BigIdeasMath.com.

Complete the statement with <, >, or =.

1. $-4 \square -1$

2. $0 \square -10$

3. $-12 \square |-13|$

4. $7 \square |-7|$

5. $\sqrt{14} \square 3.75$

6. $2\frac{1}{4} \square 2.\overline{3}$

7. $-\sqrt{15} \square -4$

8. $\pi \square 3\frac{1}{10}$

Order the values from least to greatest.

9. $3, -|-2|, |-2|, |0|, -1$

10. $-12, -|14|, 10, |-15|, -9$

11. $\pi, 3.14, \sqrt{7}, 2\frac{3}{4}, \sqrt{4}$

12. $2\pi, 5.1\overline{6}, 5\frac{1}{8}, \sqrt{25}, 5.25$

13. $-|-1|, 0.11, 0, -|11|, 1.1, |-1|$

14. $|-4^3|, |-9 \cdot 7|, 60, \sqrt{64}$