

January 14, 2019, Monday

Simplify each expression.

1) $(2p^2 - 3p^2) + (p^2 + 4p^2)$
 $3p^2 - 1p^2$
 $2(K+28)$

2) $(2k + 3k) + (1 + 2k + 4k^3)$
 $2k + 3k = 5k$
 $4k + 7k = 11k$
 $m^2 - 1m + 5m - 5$
 $m^2 + 4m - 5$

3) $7(3k + 4)$

4) $(m + 5)(m - 1)$

Jan 10-10:34 AM

Quiz Review

1) A "Remdas"
 2) B
 3) D
 4) C
 5) A
 6) C
 7) B
 8) C
 9) $5(n+20)$
 10) $\frac{n+6}{3}$

Jan 14-11:08 AM

UIT Review

1. Convert: 43 miles to feet
 $43 \text{ mi} \left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) = 227040 \text{ ft}$

2. Convert: 620 inches to cm
 $620 \text{ in} \left(\frac{2.54 \text{ cm}}{1 \text{ in}} \right) = 1574.8 \text{ cm}$

3. Convert: 30 ft/sec to miles/hour
 $30 \frac{\text{ft}}{\text{sec}} \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) \left(\frac{60 \text{ sec}}{1 \text{ min}} \right) \left(\frac{60 \text{ min}}{1 \text{ hr}} \right) = 20.5 \frac{\text{mi}}{\text{hr}}$

4. Convert: How many seconds are there in a week?
 $60 \text{ sec} \left(\frac{60 \text{ min}}{1 \text{ hr}} \right) \left(\frac{24 \text{ hr}}{1 \text{ day}} \right) \left(\frac{7 \text{ days}}{1 \text{ week}} \right) = 604800 \text{ sec}$

5. Write as an algebraic expression: Quentin has x markers. Kellen, Garrett, and Ben then gave Quentin an additional y markers each. Write an expression to represent the number of markers Quentin has now.
 $Q = x$ $B = y$ $X + Y + Y + Y$
 $K = y$ $X + 3y$

6. Write as an algebraic expression: Three times the difference of the cube of x and the square of y.
 $3(x^3 - y^2)$

7. Write as an algebraic expression: Add 5 to the product of 8 and x, then divide by 2.
 $\frac{8x + 5}{2}$

8. Identify the terms, coefficients, and constant: $36x^2 + 27x^2 - 18x - 9$
 Terms: 4 Coefficients: 36, 27, -18 Constant: -9

9. Suppose $5(3 - y) = 7x$. When $y = -10$, what is the value of x?
 Permdas $5(3 - 10) = 7x$
 $5(-7) = 7x$
 $-35 = 7x$
 $-5 = x$

10. A rectangle has a length of 10 m and a width of 200 cm. What is the perimeter of the rectangle?
 $P = 2L + 2W$
 $w = 200 \text{ cm} = 2 \text{ m}$
 $l = 10 \text{ m}$
 $P = 2(10) + 2(2) = 24 \text{ m}$

11. Simplify the expression, then determine how many terms are in the simplified expression.
 $2(8x^2 + 4x) + 4(5x^2 + 5)$
 $16x^2 + 8x + 20x^2 + 20$
 $36x^2 + 8x + 20$
 Terms: 3

12. Add the following polynomial.
 $(5x^2 - 8x + 9) + (2x^2 - 3x - 4)$
 $12x^2 - 11x + 5$

13. Subtract the following polynomial.
 $(3x^2 - 2x + 1) - (5x^2 + 1)$
 $-3x^2 + 2$

14. Multiply the following binomials.
 $(x + 7)(x + 7)$
 $x^2 + 7x + 7x + 49$
 $x^2 + 14x + 49$

15. Multiply the following binomials.
 $(x - 4)(x - 4)$
 $x^2 - 4x - 4x + 16$
 $x^2 - 8x + 16$

16. Classify the following polynomial by number of terms and by degree.
 $3x^2 + 2x$
 Name by terms: 3 = trinomial
 Name by degree: 3 = cubic

17. Sophia has 8 books in her locker. All the books are either personal books or school books. She has three times as many school books as personal books. How many school books does Sophia have in her locker?
 $S = 3P$ $P + S = 8$ $P + 3P = 8$ $4P = 8$ $P = 2$
 $S = 3(2) = 6$

18. Simplify $\sqrt{112}$
 $4\sqrt{7}$

19. Simplify $\sqrt{175}$
 $5\sqrt{7}$

20. Simplify $-4\sqrt{3} + 2\sqrt{3}$
 $-2\sqrt{3}$

21. Simplify $3\sqrt{6} + 2\sqrt{54}$
 $9\sqrt{6}$

22. Simplify $3\sqrt{2} - \sqrt{2}$
 $2\sqrt{2}$

23. Simplify $5\sqrt{10}(3 + \sqrt{5})$
 $15\sqrt{10} + 25\sqrt{10}$

24. Label the following as rational or irrational:
 $R = \frac{30}{6} = 5$ $I = \frac{1}{\pi} = \frac{1}{3.14}$

25. Which measurement is more precise?
 84 g or 2.24 mg
 2 goes to the hundredth

January 15, 2019, Tuesday

1. 43 miles into feet
 $43 \text{ mi} \left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) = 227040 \text{ ft}$

2. 165 pounds into kilograms
 $165 \text{ lb} \left(\frac{0.4536 \text{ kg}}{1 \text{ lb}} \right) = 74.836 \text{ kg}$

3. 5,400 inches to miles
 $5400 \text{ in} \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) \left(\frac{1 \text{ mi}}{5280 \text{ ft}} \right) = 0.085 \text{ mi}$

9. 1.09 g/mL to lbs/qt
 $1.09 \frac{\text{g}}{\text{mL}} \left(\frac{1 \text{ lb}}{454 \text{ g}} \right) \left(\frac{946 \text{ mL}}{1 \text{ qt}} \right) = 2.27 \frac{\text{lb}}{\text{qt}}$

Jan 10-10:35 AM

January 16, 2019, Wednesday

12. Multiply the following binomials.
 $(x - 15)(x - 3)$
 $x^2 - 18x + 45$

14. Which expression has a value that is a rational number?
 a) $\sqrt{5}$
 b) $\pi + 2$
 c) $2(\sqrt{5} + \sqrt{7})$
 d) $\sqrt{9} + \sqrt{4} = 5$

18. Which of these is a rational number?
 a) $\sqrt{5}$
 b) $\pi + 2$
 c) $-\frac{1}{3}$
 d) None of these

23. Subtract $(-5x^2 + x - 5) - (3x^2 - 8x - 3)$
 $-5x^2 + x - 5 - 3x^2 + 8x + 3$
 $-8x^2 + 9x - 2$

Jan 10-10:39 AM

Name: _____ Date: _____

Algebraic Properties

Properties of Equality	Property	Example(s)
Addition Property of Equality	If $a = b$, then $a + c = b + c$	$x = 3$ $x + 4 = 3 + 4$
Subtraction Property of Equality	If $a = b$, then $a - c = b - c$	$x = 10$ $x - 6 = 10 - 6$
Multiplication Property of Equality	If $a = b$, then $ac = bc$	$x = 7$ $2x = 2(7)$
Division Property of Equality	If $a = b$, then $a/c = b/c$	$x = 4$ $\frac{x}{2} = \frac{4}{2}$
Symmetric Property of Equality	If $a = b$, then $b = a$	$x = 3$ $3 = x$
Transitive Property of Equality	If $a = b$ and $b = c$, then $a = c$	$x = y$ $y = 4$ $x = 4$

Properties of Operations and Identities	Property	Example(s)
Commutative Property of Addition	$a + b = b + a$	$3 + 4 = 4 + 3$
Commutative Property of Multiplication	$a \cdot b = b \cdot a$	$6 \cdot 4 = 4 \cdot 6$
Associative Property of Addition	$a + (b + c) = (a + b) + c$	$2 + (6 + 3) = (2 + 6) + 3$
Associative Property of Multiplication	$a \cdot (b \cdot c) = (a \cdot b) \cdot c$	$1 \cdot (3 \cdot 2) = (1 \cdot 3) \cdot 2$
Distributive Property	$a \cdot (b + c) = a \cdot b + a \cdot c$	$3(4 + 5) = 3 \cdot 4 + 3 \cdot 5$
Multiplicative Identity Property	$a \cdot 1 = a$	$8 \cdot 1 = 8$
Additive Inverse Property	$a + (-a) = 0$	$6 + -6 = 0$
Multiplicative Inverse Property	$\frac{a}{b} \cdot \frac{b}{a} = 1$	$\frac{4}{5} \cdot \frac{5}{4} = 1$
Multiplicative Property of Zero	$a \cdot 0 = 0$	$9 \cdot 0 = 0$

Jan 10-11:13 AM

Name: _____ Date: _____

Properties of Equality

Identify the property of equality:

- $9 \cdot 7 = 7 \cdot 9$ Comm. P.O. Mult.
- $2(-3) = (-2) \cdot 3$ Asso. P.O. Mult.
- $4(a + b) = 4a + 4b$ distributive property
- $14 + 6 = 6 + 14$ Comm P.O. Add
- $3(6a) = (3 \cdot 6)a$ Asso. P.O. Mult
- If $a = b$ then $a + 4 = b + 4$ Add. P.O. Equality
- $55 + 6 = 6 + 55$ Comm. prop. of Add
- $(x + 3) + y = x + (3 + y)$ ASSO. prop of Add
- If $a = c$, then $a - 5 = c - 5$ Subt prop. of equ.
- $9 \cdot (5 + 35) = (9 \cdot 5) + 35$ Asso. P.O. Mult
- $8(a + c) = 8a + 8c$ Distr. Prop.
- $A + B = B + A$ Comm P.O. add
- $4(-2) = (-4) \cdot 2$ Asso. P.O. Mult

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Name: _____ Period: _____

Properties of Equality Practice

For each problem, complete the table by filling in the missing equation or step.

- | Equation | Step |
|----------------|----------------------------------|
| $3x + 12 = 18$ | Original Equation |
| $3x = 6$ | Subtraction property of equality |
| $x = 2$ | |
- | Equation | Step |
|---------------|----------------------------------|
| $3k + 5 = 17$ | Original Equation |
| | Subtraction property of equality |
| $k = 4$ | Division property of equality |
- | Equation | Step |
|-----------------------|----------------------------------|
| $3(5x - 1) = 13x + 5$ | Original Equation |
| $15x - 3 = 13x + 5$ | |
| $2x - 3 = 5$ | Subtraction property of equality |
| $2x = 8$ | |
| $x = 4$ | |
- | Equation | Step |
|-----------------------|----------------------------------|
| $\frac{v + 9}{3} = 8$ | Original equation |
| $v + 9 = 24$ | |
| | Subtraction property of equality |

Jan 10-11:13 AM

- | Equation | Step |
|-----------------|-------------------|
| $2(n + 5) = -2$ | Original equation |
| | |
| $n = -6$ | |
- | Equation | Step |
|---------------------|-------------------|
| $7y - 84 = 2y + 61$ | Original Equation |
| | |
| $y = 29$ | |
- | Equation | Step |
|-----------------------|-------------------|
| $\frac{x + 5}{6} = 2$ | Original Equation |
| | |
| $x = 7$ | |
- | Equation | Step |
|-------------------------|-------------------|
| $2(12x - 1) = 4(x + 2)$ | Original Equation |
| | |
| $x = \frac{1}{2}$ | |

Jan 10-11:14 AM

GSE Algebra I Unit 2A Practice

Properties of Equalities

Identify the property of equality that justifies each missing step or equation in each of the following tables.

- | Equation | Steps |
|---------------------|-------------------------------|
| $3x + 12 = 5x - 18$ | Given |
| $12 = 2x - 18$ | Sub P.O. Equ |
| $30 = 2x - 5$ | Addition Property of Equality |
| $6 = x$ | Div P.O. Equ |
- | Equation | Steps |
|---------------|-------------------------------|
| $3k + 5 = 17$ | Given |
| $3k = 12$ | |
| | Division Property of Equality |
- | Equation | Steps |
|-----------------|-------|
| $-6a - 5 = -95$ | Given |
| | |
| | |

Jan 10-11:14 AM

GSE Algebra I Unit 2A Practice

- | Equation | Steps |
|-----------------------|-------|
| $3(5x + 1) = 13x + 5$ | Given |
| | |
| | |
| | |
| | |
- | Equation | Steps |
|---------------------|-------|
| $7y - 84 = 2y + 61$ | Given |
| | |
| | |
| | |
- | Equation | Steps |
|------------------------------|----------------------|
| $4(5n + 7) - 3n = 3(4n - 9)$ | Given |
| $20n + 28 - 3n = 12n - 27$ | Distr prop |
| $17n + 28 = 12n - 27$ | Combining like terms |
| $5n + 28 = -27$ | Subt p.o. equ |
| $5n = -55$ | Subt P.O. Equ |
| $n = -11$ | Div p.o. equ |

Jan 10-11:16 AM

January 17, 2019, Thursday

List 3 algebraic properties and an example for each.

Jan 10-11:16 AM

GSE Algebra 1
Properties Quick Check

Name _____
Block _____ Date _____

For 1-10, Match the following property with its example.

1. Commutative Property of Addition	A. $6 \cdot 0 = 0$
2. Commutative Property of Multiplication	B. $6 + (5 + 1) = (6 + 5) + 1$
3. Associative Property of Addition	C. $\frac{1}{4} \cdot \frac{2}{3} = \frac{2}{12}$
4. Associative Property of Multiplication	D. $3(2x + 8) = 6x + 24$
5. Distributive Property	E. $10 + (-10) = 0$
6. Additive Identity Property	F. $7 - 0 = 7$
7. Multiplicative Identity Property	G. $8 \cdot 1 = 8$
8. Additive Inverse Property	H. $2 \cdot (3 \cdot 8) = (2 \cdot 3) \cdot 8$
9. Multiplicative Inverse Property	I. $9 + 0 = 9$
10. Multiplicative Property of Zero	J. $8 + 0 = 8$

For 11-12, Identify the property of equality that justifies each missing step or equation in each of the tables below.

11.

Statement	Reason
1. $14x + 8 = 12x + 10$	Given
2. $2x + 8 = 10$	
3. $2x = 2$	Subtraction Property of Equality
4. $x = 1$	

12.

Statement	Reason
1. $4(2x + 1) = 2x + 28$	Given
2.	Distributive Property
3. $6x + 4 = 28$	
4.	Subtraction Property of Equality
5. $x = 4$	Division Property

Jan 10-11:21 AM

Literal Equations and Dimensional Analysis Task

1. The area of a triangle is found using the formula $A = \frac{1}{2}bh$.

a. Find the area of a triangle with a height of 6cm and a base of 3cm.

b. Solve the area formula for b .

c. Find the base of a triangle whose area is 20in and whose height is 4in.

2. The formula $d = rt$ tells the distance traveled at a given rate and time.

a. Solve the equation for t .

b. Determine how long it will take an airplane to travel 2,000 miles if it flies:

- 200 miles per hour
- 400 miles per hour
- 600 miles per hour

3. The formula for the perimeter of a package is $P = 2L + 2W$, where L is the length and W is the width.

a. Solve the formula for length.

b. What is the length of a package that has a perimeter of 22 cm and a width of 5 cm?

4. The formula $S = L - I$ shows the relationship among the sale price S , the list price L , and the discount rate I .

a. Solve for r .

b. Use the new formula to find the discount rate as a decimal and as a percent.

i. Sale price of \$40 and list price of \$50.

ii. Sale price of \$102 and list price of \$120.

5. The volume of a box V is given by the formula $V = lwh$.

a. Solve the formula for h .

b. What is the height of a box with a volume of 50 cubic meters, length of 10 meters, and width of 2 meters?

Jan 10-11:19 AM

Literal Equations and Dimensional Analysis Task

1. The area of a triangle is found using the formula $A = \frac{1}{2}bh$.

a. Find the area of a triangle with a height of 6cm and a base of 3cm.

b. Solve the area formula for b .

c. Find the base of a triangle whose area is 20in and whose height is 4in.

2. The formula $d = rt$ tells the distance traveled at a given rate and time.

a. Solve the equation for t .

b. Determine how long it will take an airplane to travel 2,000 miles if it flies:

- 200 miles per hour
- 400 miles per hour
- 600 miles per hour

3. The formula for the perimeter of a package is $P = 2L + 2W$, where L is the length and W is the width.

a. Solve the formula for length.

b. What is the length of a package that has a perimeter of 22 cm and a width of 5 cm?

4. The formula $S = L - I$ shows the relationship among the sale price S , the list price L , and the discount rate I .

a. Solve for r .

b. Use the new formula to find the discount rate as a decimal and as a percent.

- Sale price of \$40 and list price of \$50.
- Sale price of \$102 and list price of \$120.

5. The volume of a box V is given by the formula $V = lwh$.

a. Solve the formula for h .

b. What is the height of a box with a volume of 50 cubic meters, length of 10 meters, and width of 2 meters?

Jan 10-11:20 AM

GSE Algebra 1 Unit 2A Practice

Solving for Missing Variable

Ex 1) $2x + 1 = 10$ Do Undo $2x + 1 - 1 = 10 - 1$ Do Undo $2x = 9$ Do Undo $x = 4.5$

Ex 2) $3x + 2 = 11$ Do Undo $3x + 2 - 2 = 11 - 2$ Do Undo $3x = 9$ Do Undo $x = 3$

Practice Problems: Rewrite each equation in terms of the indicated (letter).

- $P = 2L + 2W$ (W)
- $S = 2rh$ (h)
- $E = mc^2$ (m)
- $-20x - 5y = 30$ (y)
- $A = \frac{bh}{2}$ (h)
- $y = mx + b$ (y)
- $F = \frac{1}{3}Bh$ (h)
- $A = \frac{a+b+c}{3}$ (c)
- $m = \frac{2E}{V}$ (E)
- $6x + 3y = -15$ (y)

Jan 10-11:22 AM

GSE Algebra 1 Unit 2A Practice

Rewrite each equation in terms of the indicated (letter).

- $P = 2L + 2W$ (W)
- $S = 2rh$ (h)
- $E = mc^2$ (m)
- $-20x - 5y = 30$ (y)
- $A = \frac{bh}{2}$ (h)
- $y = mx + b$ (y)
- $F = \frac{1}{3}Bh$ (h)
- $A = \frac{a+b+c}{3}$ (c)
- $m = \frac{2E}{V}$ (E)
- $6x + 3y = -15$ (y)

Jan 10-11:22 AM

January 18, 2019, Friday

1) Solve: $y = mx + b$ for b

$$y = mx + b$$

$$-mx - mx$$

$$y - mx = b$$

2) Solve: $y = mx + b$ for x

$$y = mx + b$$

$$-b -b$$

$$\frac{y - b}{m} = \frac{mx}{m} \rightarrow \frac{y - b}{m} = x$$

Jan 10-11:23 AM

Slope intercept form: $y = mx + b$

$m = \text{slope} = \frac{\text{rise}}{\text{run}}$ (fraction)

Algebra 1 $b = y$ -intercept where graph crosses the y-axis

Graph $y = mx + b$ the y-intercept and graph the equation.

1) $y = \frac{1}{2}x + 6$
 $m = \frac{1}{2}$
 $b = 6$

2) $y = -\frac{1}{3}x + 2$
 $m = -\frac{1}{3}$
 $b = 2$

3) $y = \frac{2}{3}x + 2$
 $m = \frac{2}{3}$
 $b = 2$

4) $y = \frac{1}{4}x - 3$
 $m = \frac{1}{4}$
 $b = -3$

5) $y = -2x + 0$
 $m = -2$
 $b = 0$

6) $y = -\frac{1}{5}x + 5$
 $m = -\frac{1}{5}$
 $b = 5$

Find the a) slope, b) y-intercept, and c) the equation of each line below.

7) $m = \frac{3}{4}$
 $b = 1$
 equation is $y = \frac{3}{4}x + 1$

8) $m = -1$
 $b = 0$
 equation is $y = -x$

9) $m = -\frac{1}{6}$
 $b = 4$
 equation is $y = -\frac{1}{6}x + 4$

Jan 10-11:25 AM

$y = mx + b$

For each equation, identify the slope and y-intercept.

10) $y = 5x + 8$ 11) $y = -x - 9$ 12) $1 + 2x = y$ 13) $y = \frac{1}{2}x$

$m = 5, b = 8$ $m = -1, b = -9$ $m = 2, b = 1$ $m = \frac{1}{2}, b = 0$

Write each equation in slope-intercept form. Then graph the line.

14) $y = x + 12$ 15) $-3x + 6y = 12$ 16) $20x - y = 60$

17) $8x = 16 + 2y$ 18) $8x = 14$ 19) $3x = 10 - 5y$

20) $8 = x - 4$ 21) $y = 4x - 5$ 22) $7 = 2x - 10$

22) $2x + 4y = -6$ 23) $-3x - 2y = 4$ 24) $2x - y = 4$

$m = \quad b = \quad$ $m = \quad b = \quad$ $m = \quad b = \quad$

Jan 17-12:58 PM

Creating Linear Equations in Two Variables

- A cab company charges a \$3 boarding rate in addition to its meter which is \$2 for every mile.
- The restaurant is having a special tonight in which you can get a drink for \$2.50 and then purchase some wings for \$3.00 each.
- A gear on a machine turns at a rate of 2 revolutions per second.
- The carpenter is going to build his new house for Habitat for Humanity. The carpenter quoted a price of \$125,000 for the supplies and then for a discounted price, his hourly rate would be \$5 per hour.
- A cab company charges an initial rate of \$2.50 for a ride, plus \$0.40 for each mile driven.
- Matthew receives a base weekly salary of \$300 plus a commission of \$50 for each vacuum he sells.
- A water company charges a monthly fee of \$6.70 plus a usage fee of \$2.60 per 1,000 gallons used.
- Maddie borrowed \$1,200 from a friend to buy a new TV. Her friend doesn't charge any interest, and Maddie makes \$40 payments each month.
- You and some friends are hiking the Appalachian trail. You started out with 70 pounds of food for the group, and eat about 8 pounds each day.
- The trash company is charging \$17 per month and \$25 trash can rental fee.
- Juan paid \$20 per pants and a shirt for \$25.
- Mr. Koller's Rentals rent a Cadillac Escalade for \$99 for one week plus \$0.11 per mile.
- We went looking at different cell phone packages. Package A has a base rate of \$39.95 and will cost 0.12 per minute.
- Kim and Cynal are starting a business tutoring students in math. They rent an office for \$400 per month and charge \$40 per hour per student.

Jan 17-1:00 PM

Applications of Standard to Slope-Intercept Form

- Jennifer is a college student who works two jobs after school and on weekends trying to make some extra spending money and to help pay for her tuition. At Job X, she gets \$8 an hour, and at job Y, she gets \$10 an hour. If Jennifer works at both Job X and Job Y during the week.
 - Write an expression for her total income for working x hours at Job X and y hours at Job Y.
 - How much will she make if she works 10 hours at each job during the week?
 - If Jennifer wants to make \$100 combined for working her two jobs, write an equation to represent this situation.
 - Rewrite your equation in slope-intercept form, then graph.
 - Find three different combinations of hours worked at each job that will allow Jennifer to earn \$100.
- You are buying \$30 worth of birdseed that consists of two types of seed. Thistle seed attracts finches and costs \$2 per pound. Dark oil sunflower seed attracts many kinds of birds and costs \$1.50 per pound.
 - Write an equation that represents the different amounts of \$2 thistle seed, x , and \$1.50 dark oil sunflower seed, y , that you could buy.
 - Graph the line representing the possible seed mixtures.
 - List three possible combinations of seed mixtures.

Jan 17-1:01 PM