

Rising Geometry

Students

Summer Skills

Workbook

June 2018

Name _____

This booklet is a review of the main Algebra I concepts. You should complete each page.

Turn this booklet in the first day back to school.

Please be sure to not use the calculator when you see this symbol.



For questions or comments, please email

Evaluate the following when $x = 4$, $y = -2$, and $z = 5$. Show all work.

Evaluate means to substitute the value in for each variable and simplify the expression.

1) $3x - y$

2) $x^2 + z$

3) $4z - 3z$

4) x^2z

5) $x - 2y + 3z$

6) $x(y - 2z)$

7) $x^2 - y^2$

8) $\frac{1}{2}x + y^2$

9) $\frac{x - y}{-3}$

10) $|xy|$

11) $|z + x|$

12) $|2z| + |3y|$

Simplify the following by combining like terms. Like terms have the same variable and exponent. These terms can be combined with addition and subtraction without changing the exponent of each term.

1) $5x - 3x$

2) $4y - 7y$

3) $y - 6y^2 + y^2 - 3y$

4) $5x - 3y - x + 7$

5) $7y - 12 - 3y$

6) $2x - 4 + 3x + 8$

7) $5y + 3x - 2z - 3y + 6x + 8$

8) $4(x - 2) - 3(x + 7)$

9) $4 - 3(x - 5) + 2x$

10) $x^2 + 3x + 2x^2 - 8 + 4x$

11) $7x^2y + 3xy + 2x^2y - 8xy^2 + 4xy$

12) $x^2y^2 + 3y + 5x^2y - 4x^2y^2 + 4y$

13) $5(x - 2y + 3) - 2(2y + 3x + 7)$

14) $2y^2 + 3y - 9y - 7y^2 + 4y$



Use order of operations (PEMDAS) to simplify the following.

1) $8 + 6 - 3$

2) $15 - (7 - 2) - 3$

3) $5(4) - 10$

4) $24 - 21 \div 3$

5) $18 - 12 \div 4$

6) $12 - (4 + 7)$

7) $7(3 + 4)$

8) $12 \div 3 \cdot 4$

9) $(11 + 4) \div 5$

10) $(12 \cdot 4) \div (2 \cdot 2)$

11) $30 \div 6 - 1$

12) $42 \div (5 + 2) \cdot 3$

13) $4 + 3(7 - 2)$

14) $5(6 - 8)$

15) $15 - 2(8 + 3)$

16) $2 - 8 \div 4$

17) $4 - 8 + 6$

18) $10 - 3(4)$



Simplify the following:

1) $\frac{1}{2} + \frac{3}{5}$

2) $\frac{4}{5} - 1\frac{3}{5}$

3) $2\frac{1}{3} - 1\frac{2}{5}$

4) $\frac{2}{7} + \frac{4}{9}$

5) $2\frac{2}{5} + 5.256$

6) $\frac{3}{5} + \frac{2}{3} - \frac{3}{10}$

7) $\frac{3}{5} \cdot \frac{2}{9}$

8) $1\frac{1}{5} \cdot \frac{5}{6}$

9) $2\frac{3}{4} \cdot 1\frac{3}{5}$

10) $\frac{3}{4} \div \frac{3}{5}$

11) $\frac{1}{4} \div \frac{3}{4}$

12) $3\frac{1}{7} \div 1\frac{1}{4}$

Simplify the following using the rules for exponents:

1) $x^2 \cdot x^3$

2) $x^5 \cdot x \cdot x^4$

3) $2x^5 \cdot 3x^4$

4) $-4x^3 \cdot 3x$

5) $-3x^3y(-2x^4)(xy^4)$

6) $x^3y \cdot x^4yz \cdot xy^4z^3$

7) $(x^2)^4$

8) $(x^3y)^5$

9) $(-2x^4y^3)^3$

10) $\left(\frac{1}{2}x^4\right)^3$

11) $(x^4)^3(x^2)^5$

12) $(-2xy)^3(3x^2y^2)^2$

13) $(2x)(3x^4) + (x^3)(5x^2)$

14) $(3x)^2(-4y)^3 + (2y)^3(-7x)^2$

15) $7x^2y(3x + 2xy - 5y^2)$

16) $x^2y^2(y^3 + y - 2)$

Solve for x. Show all work.

1) $.5x = 3.5$

2) $\frac{x}{2} = \frac{-7}{4}$

3) $\frac{2}{3}x + 309 = 711$

4) $3x - 4 = -22$

5) $5 - x = 12$

6) $\frac{x}{3} + 5 = 7$

7) $5(x - 3) = -20$

8) $-3(4 - x) = 12$

9) $\frac{2}{3}(x - 9) = 14$

10) $4(x - 3) = 3(x + 7)$

11) $5(2x + 3) = 7(x - 3)$

12) $2(x - 3) - 4 = 10$

13) $5(x - 2) - 3(x + 4) = -20$

14) $5x - 13 = 2x + 14$

15) $12 - 7x = -3x - 8$

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Solve the following multi-step equations:

1) $2x + 4 = 8x - 26$

2) $3x - 9 = 2x + 8$

$$3) x - 12 = 5x$$

$$4) 7x - 9 = 4x$$

$$5) 3x - 8 = x + 12$$

$$6) 4x + 8 = 2x + 7$$

$$7) 4(x - 3) = -12$$

$$8) 5(2x + 7) = -15$$

$$9) 4(x + 6) = 2(x - 4)$$

$$10) 3(2x - 7) = 6 + 2(x - 3)$$

$$11) \frac{2x - 1}{3} = 5$$

$$12) \frac{3x + 4}{2} = 5$$

The slope m of a line describes how steep it is. The slope is calculated by finding the quotient of the vertical change (change in y) and the horizontal change (change



in x). Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Find the slope of the line that contains each pair of points.

- 1) (2, 4), (4, 6)
- 2) (3, 2), (-2, -8)
- 3) (-1, 3), (-2, 5)
- 4) (8, -3), (10, 0)
- 5) (0, 0), (6, -3)
- 6) (3, 4), (-1, 4)
- 7) (-4, 7), (-7, 15)
- 8) (2, -2), (6, 5)
- 9) (4, 3), (4, -5)
- 10) (2, 8), (7, -7)

The number 18 is not a perfect square, but it does have a perfect square factor.

$\sqrt{18} = \sqrt{9} \cdot \sqrt{2}$ should be further simplified to $3\sqrt{2}$. Simplify the following radicals.

Think of the largest perfect square that can be simplified.

1) $\sqrt{28}$

2) $-\sqrt{18}$

3) $-\sqrt{8}$

4) $\pm\sqrt{75}$

5) $\sqrt{63}$

6) $\sqrt{500}$

7) $-\sqrt{242}$

8) $-\sqrt{50}$

9) $\sqrt{700}$

10) $\sqrt{98}$

11) $\sqrt{20}$

12) $\sqrt{45}$

13) $-\sqrt{24}$

14) $\sqrt{12}$

15) $\pm\sqrt{48}$

Rising Geometry Students Summer Skills Work**Page 10****Multiply the following either using Distributive Property or FOIL:**

1) $(x + 4)(x + 8)$

2) $(x - 4)(x + 7)$

3) $(x - 5)(x - 8)$

4) $(x + 9)(x - 8)$

5) $(x + 3)(x - 6)$

6) $(x + 7)(x - 8)$

7) $(x + 10)(x + 8)$

8) $(x - 11)(x + 2)$

9) $(x - 12)(x + 4)$

10) $(x + 15)(x - 3)$

11) $(2x + 1)(x + 3)$

12) $(2x - 3)(x + 5)$

13) $(2x - 5)(3x + 4)$

14) $(3x + 5)(2x + 4)$

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Factor the following trinomials.

1) $x^2 + 5x + 6$

2) $x^2 + 9x + 8$

3) $x^2 + 12x + 32$

4) $x^2 + 15x + 26$

5) $x^2 + 7x + 12$

6) $x^2 + 7x + 6$

7) $x^2 + 7x + 10$

8) $x^2 - 9x + 20$

9) $x^2 - 9x + 18$

10) $x^2 - 9x + 14$

11) $x^2 - 9x + 8$

12) $x^2 - 10x + 24$

13) $x^2 + 10x - 11$

14) $x^2 + 10x - 39$

15) $x^2 + 8x - 20$

16) $x^2 + 5x - 14$

17) $x^2 + 4x - 21$

18) $x^2 - 4x - 12$

19) $x^2 - 8x - 20$

20) $x^2 - 11x - 60$

21) $x^2 - 9x - 10$

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Factor the following trinomials.

1) $2\boxed{a}^2 + 5\boxed{a} + 2$

2) $3\boxed{a}^2 + 5\boxed{a} + 2$

3) $2\boxed{a}^2 + 9\boxed{a} - 5$

4) $3\boxed{a}^2 - 7\boxed{a} + 2$

5) $2\boxed{a}^2 - 11\boxed{a} + 15$

6) $9\boxed{a}^2 + 6\boxed{a} - 8$

7) $8\boxed{a}^2 - 2\boxed{a} - 10$

8) $6\boxed{a}^2 + 9\boxed{a} - 27$

9) $60\boxed{a}^2 + 4\boxed{a} - 8$

10) $20x^2 + 55x + 30$

11) $12x - 27$

12) $4x^3x - 8x^2x^2$

13) $x^2 - 121$

14) $x^2 - 25x^2$

15) $x^3 + 16x^2 + 64x$

16) $x^2 - 6x - 27$

17) $6x^2 - 28x + 32$

18) $4x^2 + 4x - 80$

19) $3x^3 - 21x^2 + 2x - 14$

20) $x^3 - 9x^2x + xx - 9x^2$