

Lawrence High School

Math Department



Summer Review

For Students Entering

Geometry

Please show your work on the following problems. This packet will be collected by your math teacher so don't forget to bring your finished work back with you in August. If you need assistance on a topic check out: <https://www.wolframalpha.com/>, <https://www.khanacademy.org/>, <http://www.purplemath.com/>, or google the topic.

Fractions:

Multiply Fractions.

1. $\frac{1}{2} \cdot \frac{5}{6}$

2. $\frac{4}{11} \cdot \frac{3}{2}$

3. $3 \cdot \frac{3}{6}$

Divide Fractions.

4. $\frac{1}{2} \div \frac{5}{6}$

5. $\frac{4}{11} \div \frac{3}{2}$

6. $3 \div \frac{3}{6}$

Add Fractions.

7. $\frac{8}{9} + \frac{7}{9}$

8. $\frac{3}{4} + \frac{5}{6}$

9. $\frac{3}{7} + 5$

Subtract Fractions.

10. $\frac{8}{11} - \frac{2}{5}$

11. $\frac{2}{12} - \frac{3}{2}$

12. $3 - \frac{1}{7}$

Order of Operations:

Evaluate each expression without using a calculator.

1. $8 \cdot 17 \div 5 - 2$

2. $14 \div 7 - 2 + (8 + 13)$

3. $3^2 + (20 \div 10 + 3^2)$

4. $(9 - 7) - (16 \div 8)^2$

5. $0.7 + 0.3 \cdot (3 + 4)^2$

6. $12 + ((13 - 6) + 5^2)$

Evaluate Expressions:

Evaluate the expressions for the given values.

1. $16x + 11y$ when $x = -2$ and $y = -3$

2. $(3x)^2 - y^3$ when $x = 4$ and $y = 5$

3. $\frac{x + 2y}{4x - y}$ when $x = -3$ and $y = 4$

4. $a + (18 - a) \cdot b$ when $a = 4$ and $b = 1$

Combine Like Terms:

Examples of combining like terms.

$$16c + 2(8 - 7c)$$

$$16c + 16 - 14c \quad \text{Distributive Property}$$

$$2c + 16 \quad \text{combine like terms}$$

- Notice: $2c + 16$ **DOES NOT** become $18c$.

$$7x + 2x \quad \text{combines to be } 9x$$

$$5y^7 - 3y^7 \quad \text{combines to be } 2y^7$$

$$6z^4 - 9z^4 \quad \text{combines to be } -3z^4$$

$(6 - 9 = 6 + (-3) = -3)$

$$z^8 + 9z^8 \quad \text{combines to } 10z^8$$

a variable with no coefficient
has an implied coefficient of 1

Simplify each Expression.

1. $-5a - 14a$

2. $33s - 12s$

3. $12k + 11(3k - 5)$

4. $-5(3b + 4) - 6(3 + 6b)$

5. $4(-3a + 13) + 3(a + 4)$

6. $-11x + 2(9 + 7x)$

7. $-9x - (17 - 7x)$

8. $3a + 7 - 11 - 9a$

Find the sum or difference.

9. $(-5x^2 - 2) + (3x^2 + 7)$

10. $(2 - 3x) + (14x - 7x^2 - 5)$

11. $(-x + 3) + (-11x^2 - 8 + 12x)$

12. $(2b^3 - 5b) - (7b + 3b^2)$

Solving Equations:

Examples of solving equations.

$$\begin{aligned} 4x + 9 &= 2x - 6 \\ \frac{-2x}{2x + 9} &= \frac{-2x}{-6} \\ \frac{-9}{2x} &= \frac{-9}{-6} \\ 2x &= -15 \\ \frac{2x}{2} &= \frac{-15}{2} \\ x &= -\frac{15}{2} \end{aligned}$$

$$\begin{aligned} -3(x - 6) + 4(x + 1) &= 7x - 10 \\ -3x + 18 + 4x + 4 &= 7x - 10 \\ x + 22 &= 7x - 10 \\ \frac{-7x - 22}{-6x} &= \frac{-7x - 22}{-32} \\ -6x &= -32 \\ -6x &= -32 \\ x &= \frac{-32}{-6} = \frac{16}{3} \end{aligned}$$

Solve the following equations for the variable.

1. $x + 2 = 17 - 4x$

2. $6 + 10n - 4n = n + 1$

3. $\frac{2x}{3} + 4 = 10$

4. $24 = 6(-h - 3)$

5. $12(2k + 11) = 12(2k + 13)$

6. $-(-6t - 3) = 12$

Solving Equations Using Square Roots:

Examples:

$$\sqrt{x^2} = \sqrt{25}$$
$$x = \pm 5$$
$$(5)^2 = 25$$
$$(-5)^2 = 25$$

$$\frac{2}{3}x^2 = \frac{18}{2}$$
$$\sqrt{x^2} = \sqrt{9}$$
$$x = \pm 3$$
$$(3)^2 = 9$$
$$(-3)^2 = 9$$

$$3x^2 - 4 = 8$$
$$\frac{3x^2}{3} = \frac{12}{3}$$
$$\sqrt{x^2} = \sqrt{4}$$
$$x = \pm 2$$

Solve the following equations for the variable.

1. $x^2 = 64$

2. $3x^2 = 300$

3. $5x^2 + 10 = 90$

Slope-Intercept Form:

Example: $3x - 5y = -10$

$$\begin{array}{r} -3x \quad -3x \\ \hline -5y = -3x - 10 \end{array}$$

Subtract 3x from both sides

$$\begin{array}{r} -5y = -3x - 10 \\ \hline -5 \quad -5 \quad -5 \end{array}$$

Divide each term by -5

$$y = 3/5x + 2$$

$$y - 4 = 2(x - 3)$$
$$y - 4 = 2x - 6$$
$$y = 2x - 2$$

Distribute 2 inside the ().
Add 4 to get y by itself.

Write the equation in Slope-intercept form by solving for y.

1. $3y = 15x - 12$

2. $x - 5y = 10$

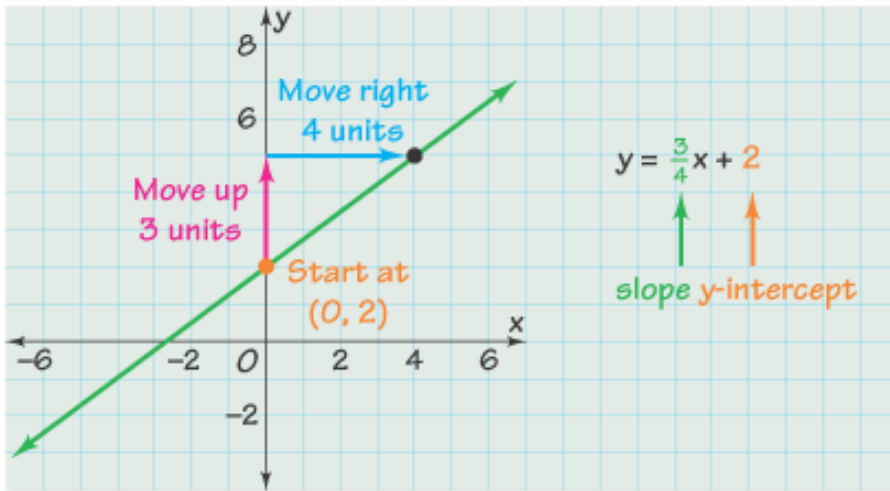
3. $4x - y = 2x + 2$

4. $y + 8 = 8(x + 2)$

5. $-y + 1 = \frac{2}{7}(x - 7)$

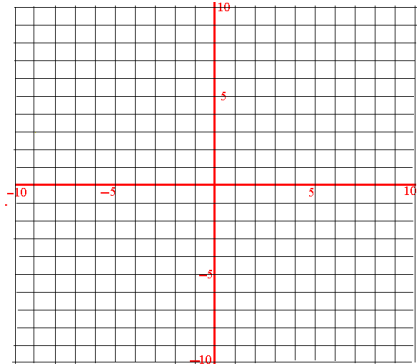
Graphing Linear Equations: If the equation is not in slope-intercept form, then you need to solve for y first.

Graph the line $y = \frac{3}{4}x + 2$.



Graph the following equations of lines.

1.) $y = -7x + 3$

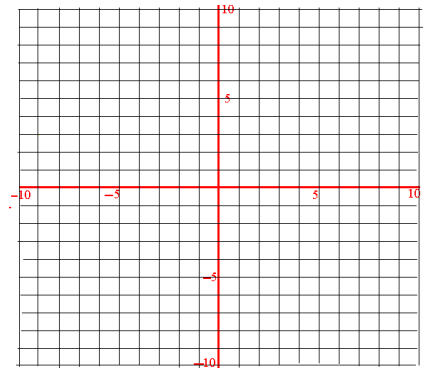
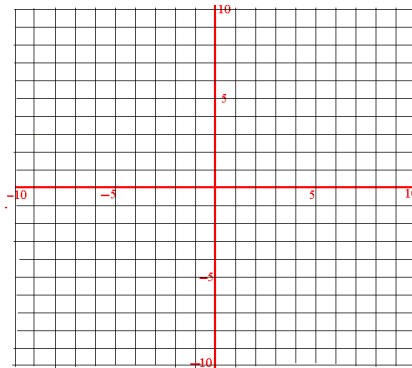
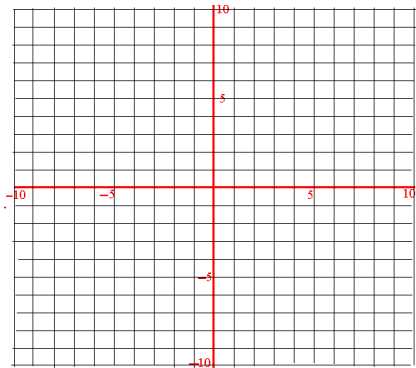


Graph the following equations of lines.

2.) $y = 2$

3.) $y = \frac{1}{2}x$

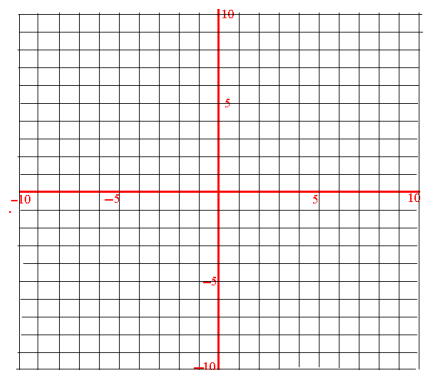
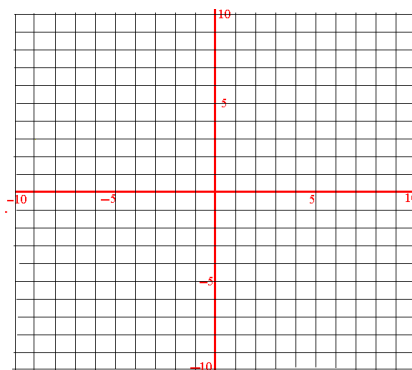
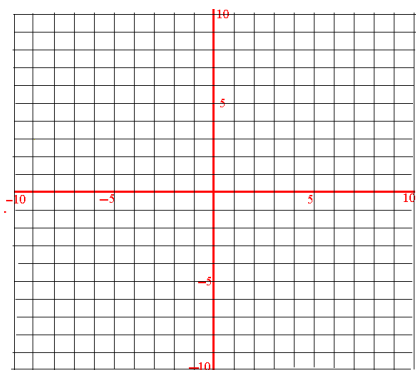
4.) $y = -\frac{5}{3}x + 2$



5.) $x = -4$

6.) $x + y = 4$

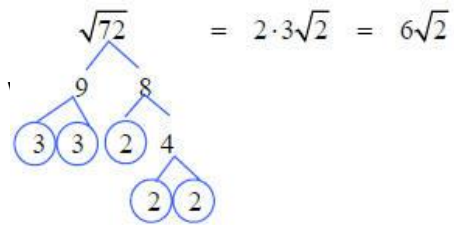
7.) $3y = 2x + 6$



Simplifying Radicals:

Examples of simplifying square roots.

Using factor trees:



Using the biggest perfect squares:

$\sqrt{18} = \sqrt{9} \cdot \sqrt{2}$ **Now we can simplify!**
 \downarrow
 $\sqrt{3^2} \cdot \sqrt{2}$ **$9 = 3^2$**
 \downarrow
 $3 \cdot \sqrt{2}$ **$\sqrt{3^2} = 3$**
 $3\sqrt{2}$ **Simplified answer**

1. $\sqrt{64}$

2. $\sqrt{20}$

3. $\sqrt{48}$

4. $\sqrt{150}$

Rounding:

Round each number to the nearest tenth.

1. 8.54

2. 6.29

3. 13.014887

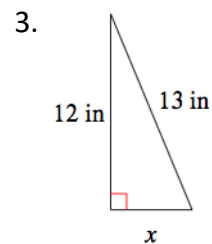
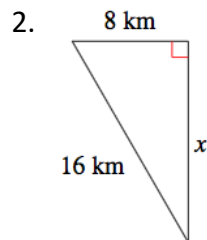
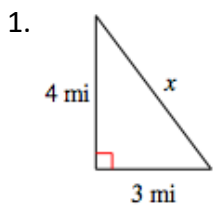
4. 421903.963

5. 0.7

6. 2.13

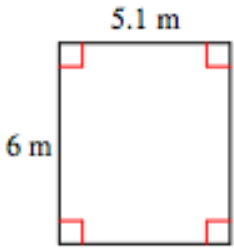
Pythagorean Theorem: $a^2 + b^2 = c^2$

Find the third side of each right triangle. Round your answer to the nearest tenth, if necessary.



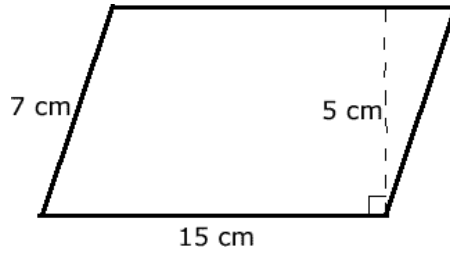
Perimeter, Area, and Circumference:

Find the perimeter, area, and/or circumference of the following figures. Label your answers. If there are no labels, use the word "units" as your label. Round answers to the nearest tenth, if necessary.



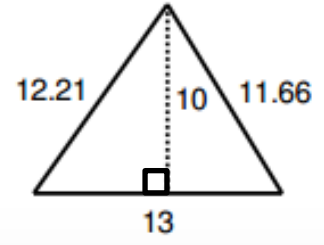
Perimeter: _____

Area: _____



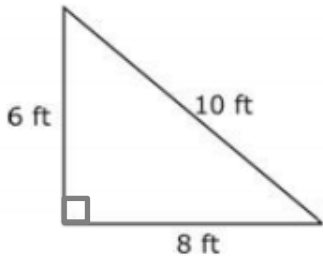
Perimeter: _____

Area: _____



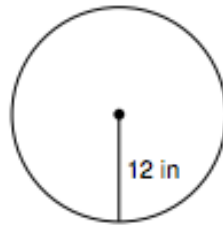
Perimeter: _____

Area: _____



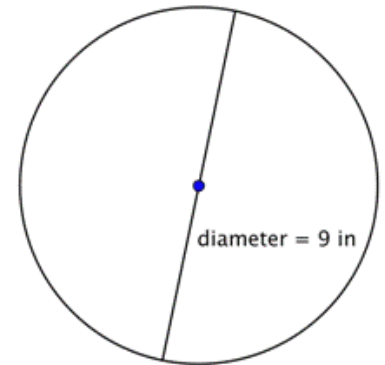
Perimeter: _____

Area: _____



Circumference: _____

Area: _____



Circumference: _____

Area: _____