Grade 8 Mathematics Reference Sheet*

CONVERSIONS

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5,280 feet
1 mile = 1,760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds
1 ton = 2,000 pounds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 3.785 liters
1 liter = 0.264 gallon
1 liter = 1,000 cubic centimeters

FORMULAS

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pythagorean Theorem	$a^2 + b^2 = c^2$

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Answer questions 56 through 65. You may use a calculator. Use the π key on your calculator for short- and extended-response questions. The use of $\frac{22}{7}$ or shortened decimal forms is not acceptable.

56 The mass of Earth is 5.97×10^{24} kilograms. The mass of the Moon is 7.34×10^{22} kilograms.

Part A

What is the combined mass of Earth and the Moon? Express your answer in scientific notation.

Show your work.

Answer _____ kilograms

Part B

How many times as great is the mass of Earth as the mass of the Moon? Express your answer in scientific notation.

Show your work.

Answer _____

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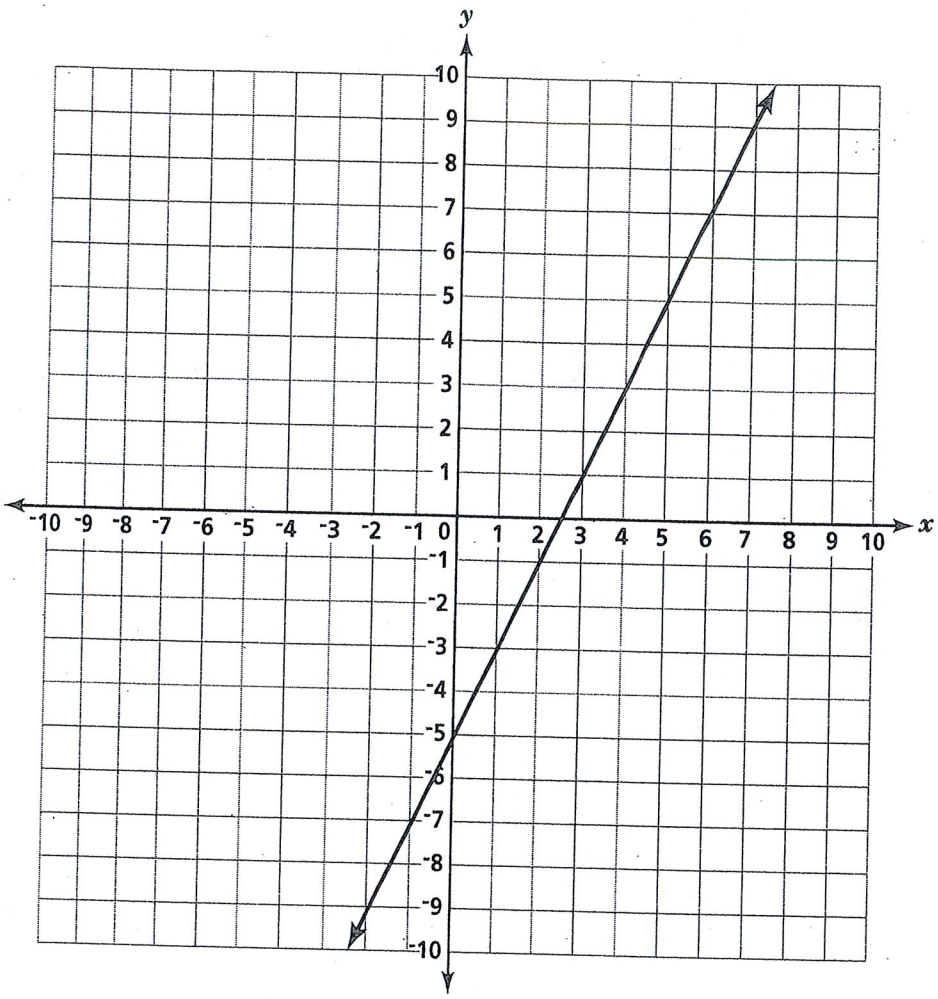
57 The graph below shows the solutions to $y = 2x - 5$.



Part A

Graph the solutions to $y = -\frac{1}{2}x$ on the same coordinate plane.

Part B

Using the graph you drew in Part A, what point is the solution to the system of equations $y = -\frac{1}{2}x$ and $y = 2x - 5$?

Answer _____

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58 The function $F = \frac{9}{5}C + 32$ gives the temperature in degrees Fahrenheit, F, based on the temperature in degrees Celsius, C.

Part A

Use the function to fill in the table with the number of degrees Fahrenheit for different numbers of degrees Celsius.

Degrees Celsius, C	Degrees Fahrenheit, F
−15	
−10	
−5	
0	
5	
10	
15	

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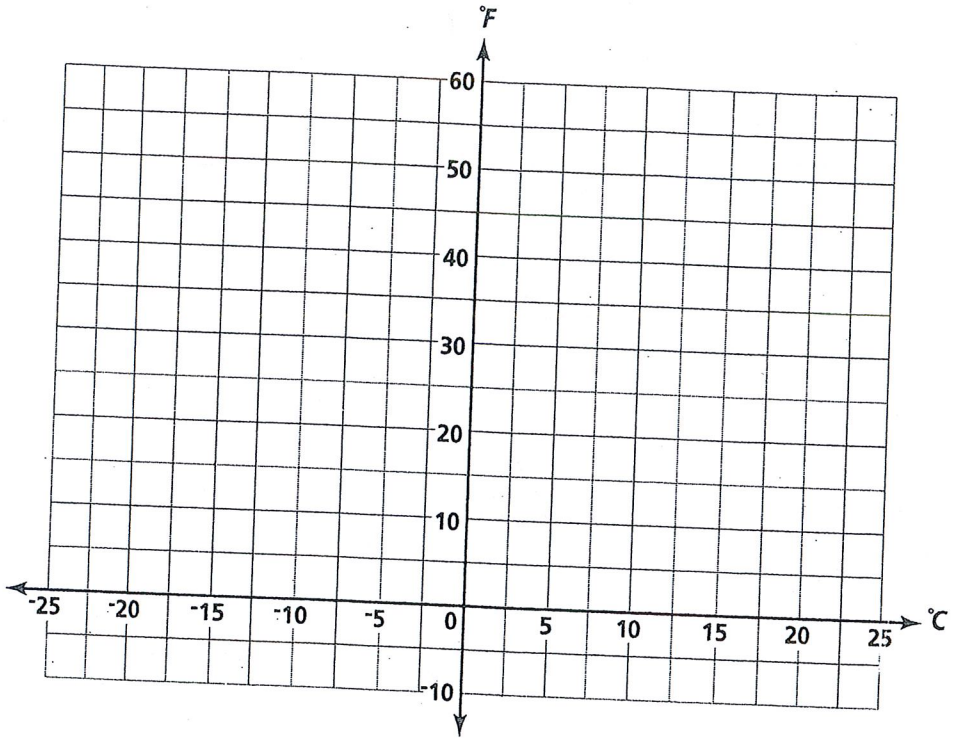
Part B

Graph the relationship between degrees Celsius and degrees Fahrenheit.



Part C

Is $F = \frac{9}{5}C + 32$ a linear function? Explain your answer.

_____

_____

_____

_____

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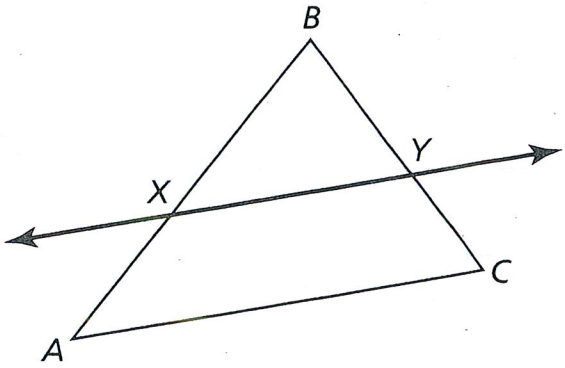
59 Line XY is parallel to line segment AC as shown in the figure below.



Part A

Name two similar triangles shown in the figure.

Answer _____

Part B

Explain why the triangles are similar.

_____

_____

_____

_____

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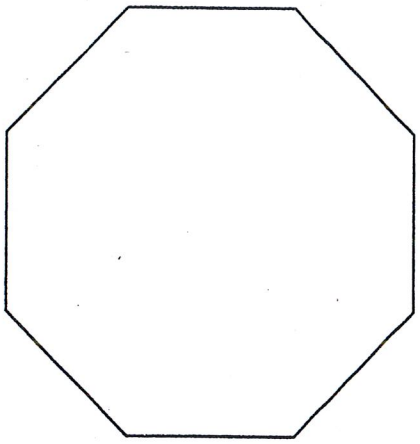
60 A stop sign is shown. Each side measures 12.4 inches, and the distance from any side to the opposite side is 30 inches.



Part A

Divide the stop sign into one rectangle and two trapezoids. What are the dimensions of the rectangle and each of the trapezoids?

Show your work.

Dimensions of Rectangle

Length _____

Width _____

Dimensions of Each Trapezoid

Shorter Base _____

Longer Base _____

Height _____

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Part B

What is the area of the rectangle? What is the area of each trapezoid?

Show your work.

Area of Rectangle _____ square inches

Area of Each Trapezoid _____ square inches

Part C

What is the area of the stop sign?

Show your work.

Area of Stop Sign _____ square inches

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6 Consider the equation below.

$$\frac{1}{5}(x + 2) + 2x = 6x - 10$$

Part A

Which property can be used to simplify the expression $\frac{1}{5}(x + 2)$?

Answer _____

Part B

Collect all x-terms on one side of the equation and all constants on the other side, and combine like terms.

Show your work.

Answer _____

Part C

What is the value of x?

Show your work.

Answer _____

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62 The table below shows the daily temperature and sales of lemonade at Cool Lemonade Shop for the past 10 days.

Temperature (°F)	Sales ($)
64.4	119
68.2	130
62.8	115
71	140
67.8	128
72.6	142
78.8	165
75	154
63.4	118
59.8	112

Part A

Sketch a scatter plot to show the relationship between the daily temperature and sales of lemonade shown in the table above.

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Part B

What type of association does the scatter plot show, linear or nonlinear? Explain your answer.

_____

_____

_____

Part C

What type of association does the scatter plot show, positive or negative? Explain your answer.

_____

_____

_____

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63 Consider the pair of linear equations below.

$$4x + 6y = 12$$

$$2x + 3y = 6$$

Part A

What is the relationship, if any, between the two equations?

_____

_____

Part B

Does the system of equations have one solution, no solution, or infinitely many solutions? Explain.

_____

_____

_____

Part C

How can you verify your answers to Parts A and B by solving algebraically?

_____

_____

_____

_____

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6 A campground rents canoes for a flat fee of $25 plus $5 per hour.

Part A

Write a linear function to model the relationship between the number of hours renting a canoe and the total cost of renting one. Let x represent the number of hours and y represent the total cost.

Function _____

Part B

Explain the meaning of slope in the context of the problem.

_____

_____

_____

_____

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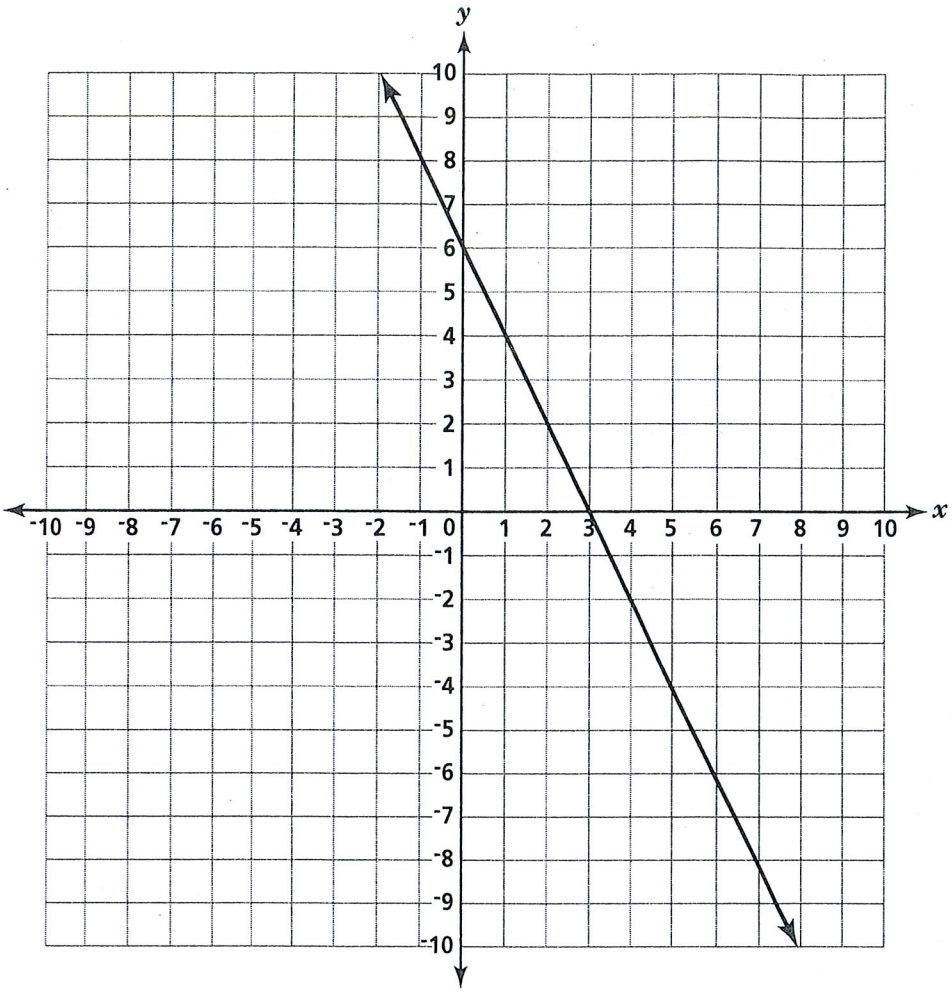
65 Consider the graph below.



Part A

Find the *y*-intercept, *b*, and the slope, *m*, of the line.

Show your work.

Answer _____

Part B

Write the equation of the line.

Equation _____

STOP

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