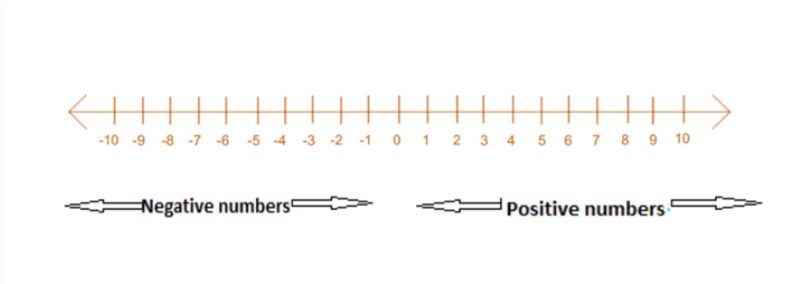
RISING GRADE 9 SUMMER PACKET

DUE ON THE FIRST DAY OF SCHOOL

The problems in this packet are designed to help you review topics from previous mathematics courses that are essential to your success in Integrated Algebra I. **You are expected to bring this completed packet to class on the first day of school.** In addition, this packet will count as part of your first quarter grade. **Upon returning, you will be ASSESSED on the content of this packet**. All contents outlined in the packet are Integrated Algebra I objectives. Neatly **SHOW YOUR WORK** on a separate sheet of paper.

1 Find the sum of the four integers below. **Hint:** Use the number line below.

4, -5, 2, -1



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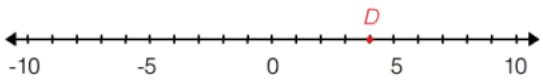
2 Use the number line. Enter the integer value that point *D* represents.



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3 Write the correct answer.
Convert the following fraction into decimal.

$\frac{15}{100}$

---

4 Write the fraction that expresses the same value as the decimal $0.\overline{12}$.

---

5 Find a decimal that is equal to each fraction.

(a) $\frac{721}{100}$

(b) $\frac{7}{5}$

(c) $\frac{1}{6}$

---

6 Express the repeating decimal $0.\overline{3}$ as a fraction.

---

7 Ana runs $\frac{3}{4}$ of a mile in $\frac{1}{10}$ of an hour (which is 6 minutes). Assuming she runs at a constant speed, what is her speed in miles per hour? Express your answer as an integer, decimal, or simplified fraction.

---

8 Convert 95% into a fraction. Write the answer in the simplest form.

---

9 Simplify.

$\sqrt{16}$

---

10 Simplify.

$\sqrt[3]{1}$

---

11 Simplify.

$\sqrt{25}$

---

12 Find the difference. Write your answer in scientific notation.

$$\left(9.7 \times 10^6\right) - \left(2.5 \times 10^6\right)$$

---

13 Find the sum. Write your answer in scientific notation.

$$\left(3.85 \times 10^8\right) + \left(4.1 \times 10^8\right)$$

14 **Write in scientific notation:** 0.00916

---

15 Find the product. Write your answer in scientific notation.

$$\left(6.9 \times 10^{5}\right) \times \left(3.1 \times 10^{-9}\right)$$

---

16 **Write in scientific notation:** 0.0121

---

17 Find the quotient. Write your answer in scientific notation.

$$\left(5.6 \times 10^{8}\right) \div \left(2.0 \times 10^{2}\right)$$

---

18 **Write in scientific notation:** $4,733,800$

---

19 **The diameter of a certain virus is 0.000000028 meter. Write this number in scientific notation.**

---

20 Find the value of x that makes the equation below true.

$\frac{1}{3}(x - 12) = 2x + 1$

---

21 Solve the given equation for z and write the correct answer.

$4z + 9 = 29$

---

22 Find the value of x that makes the equation below true.

$8 - 2(3x + 8) = 10$

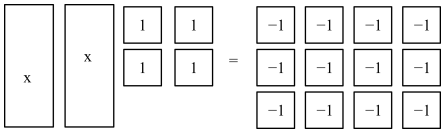
---

23 Solve the following equation for t and write the solution.

$16t - 4t = 72$

---

24 Find the equation represented by the following algebraic tiles. Combine like terms on both sides of the equation.



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25 Write an equation that represents the relationship between the given values of x and y.

x	2	4	6	8
y	11	22	33	44

---

26 Determine the solution of the equation $4x + 5 = 10 - x$ and write the correct answer.

---

27 What value of x is the solution to the linear system below?

$$\begin{cases} 4x - 5y = 24 \\ y = 2x \end{cases}$$

---

28 Solve the system of equations below using the substitution method.

$$\begin{cases} x = 2y + 11 \\ -7x - 2y = -13 \end{cases}$$

Show all work, make sure to write your final answer in the correct format. If you get no solution. Type in 0.

29 Solve the following equation:

$$\frac{7-2x}{6} = \frac{x-5}{1}$$

x =

---

30 Determine the slope from the table given below.

x	y
4	6
5	12
6	18
7	24

---

31 Determine the slope of the line passing through $(4,\ -2)$ and $(7,\ 10)$.

---

32 **PROFICIENT (5 points)**

Write the equation of the line in slope-intercept form with the following slope and y-intercept:
slope: $\frac{5}{6}$
y-intercept: $(0,\ -1)$

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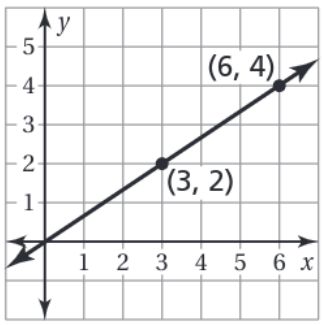
33 Find the slope of the line.



34 **Write the equation of the line in slope-intercept form with the following slope and y-intercept:**

m= $-\frac{2}{7}$

b = 4

---

35 **Write the equation of the line in slope-intercept form given the slope and a point.**

slope: $\frac{3}{4}$

point: $(4,\ 5)$

---

36 Find the slope of the equation given below.

$y = 3x + 4$

Write the correct answer.

---

37 Add the polynomials $(-4x^4 + 3x^2 + 14) + (-3x^4 - 14x^2 - 8)$

---

38 Multiply the polynomials: $(x^2 - 7x - 6)(7x^2 - 3x - 7)$

---

39 Subtract the two polynomials. Write your answer in standard form.

$5x(3x^5 - 2x^4 - 5) - 3(2x^4 + x^2 - 10)$

---

40 After simplifying, what is the leading coefficient of the polynomial?

$6x(2x - 1) + 4(x^2 - 3x + 3) - x(-4x - 6)$

---

41 Put the following polynomial into standard form:

$11 + 7x - 14x^2 + x^5$

42 Write the polynomial in standard form.

(a) $8x - 6x^2 - 3x^3$

(b) Identify the leading coefficient of the polynomial.

(c) Identify the degree of the polynomial.

---

43 What is the degree of the following polynomial:

$5x^2y - 6xy + 4x$

---

44 Factor completely over the set of integers: $16x^4 - 81$

(a)

(b) Sara graphed the polynomial $y = 16x^4 - 81$ and stated "All the roots of $y = 16x^4 - 81$ are real." Is Sara correct? Explain your reasoning.

---

45 Find the difference.

$$\left(x^4 - 2x^2 + 6x\right) - \left(14 - 6x^2 - 8x\right)$$

---

46 Subtract $5x^2 + 2x - 11$ from $3x^2 + 8x - 7$. Express the result as a trinomial.

---

47 Calculate the product and write the correct answer.
$(2x + 7)(x - 3)$

48 **Input the correct values into the quadratic formula below:**

$x^2 - 4x - 8 = 0$

$$Quadratic\ formula = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-\square \pm \sqrt{\square^2 - 4\square\square}}{2\square}$$

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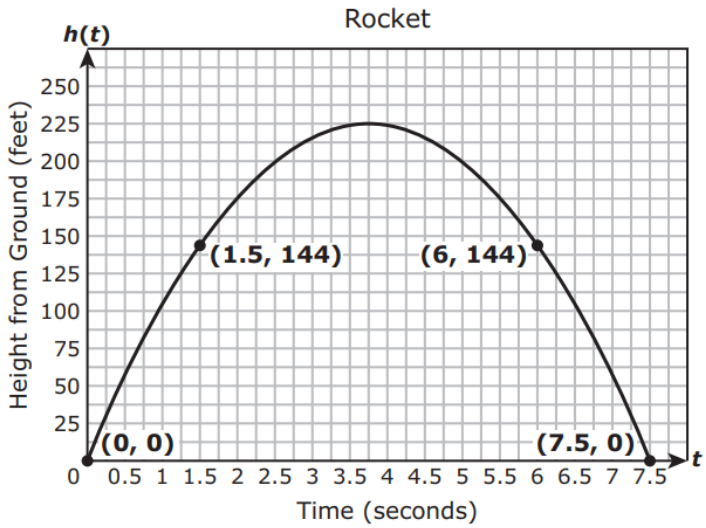
49 Quadratic function h can be used to model the height in feet of a rocket from the ground t seconds after it was launched. The graph of the function is shown.



What is the maximum value of the graph of the function?

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50 Solve the quadratic equation below for the exact values of x.

$$4x^2 - 5 = 75$$

---

51 Solve the equation by factoring.
Report solution(s) in order from least to greatest. Separate solutions with a comma. Exact answers only (no decimal answers).

$3x^2 - 16x - 12 = 0$

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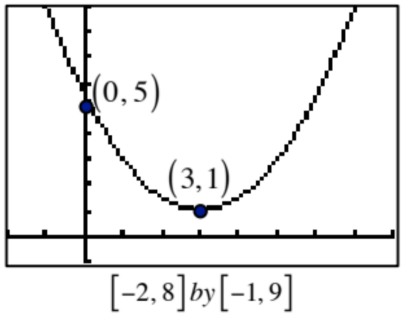
52 Solve using the quadratic formula $2x^2 - 7x - 3 = 0$

53 Write the equation for the quadratic shown in the form $y = a(x-h)^2 + k$.



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54 Factor completely:

$3x^2 + 20x + 25$

---

55 What is the positive solution to $2x^2 - 8x - 42 = 0$?

---

56 The admission at Space Tag is $10 and it costs $7 per laser tag game. Jacob has a total of $50 to spend. What is the greatest number of laser tag games he will be able to play?

---

57 What value for *c* will complete the perfect square trinomial?

$x^2 - 16x +$ ☐ $= 0$

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58 What is the x-intercept of the line 6x − 3y = 24?

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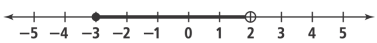
59 Write a compound inequality for the graph below.



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60 When an apple is dropped from a tower 256 feet high, the function $h(t) = -16t^2 + 256$ models the height of the apple, in feet, after t seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

61 **Rewrite the following standard form linear equation into slope-intercept form. Write the answer starting with *y=***

$$12x - 4y = -12$$

---

62 Write the polynomial in standard form.

(a) $8x - 6x^2 - 3x^3$

(b) Identify the leading coefficient of the polynomial.

(c) Identify the degree of the polynomial.

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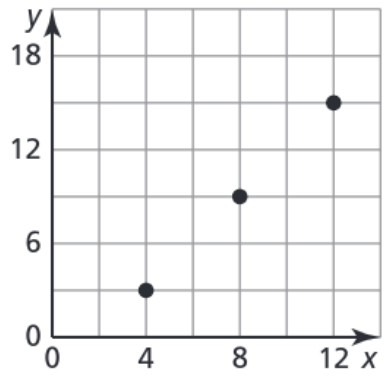
63 What is the domain of the function?

(a)



Domain: { _____ }

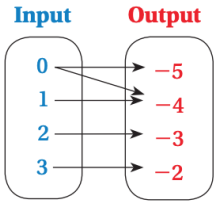
(b) Is the function discrete or continuous?

(A) discrete

(B) continuous

64 List the ordered pairs shown in the mapping diagram.

(a)



(b) Then determine whether the above relation is a function.

(A) Function

(B) Not a function

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65 Select **all** exponential functions:

A $y = \frac{3}{2}x + 3$

B $y = 3 \cdot (2)^x$

C $f(x) = .5 \cdot (3)^x$

D $y = 3x$

E $f(x) = 2 \cdot (2)^x$

F $f(x) = 4.5$

---

66 **Which statement is true about the graphs of exponential functions?**

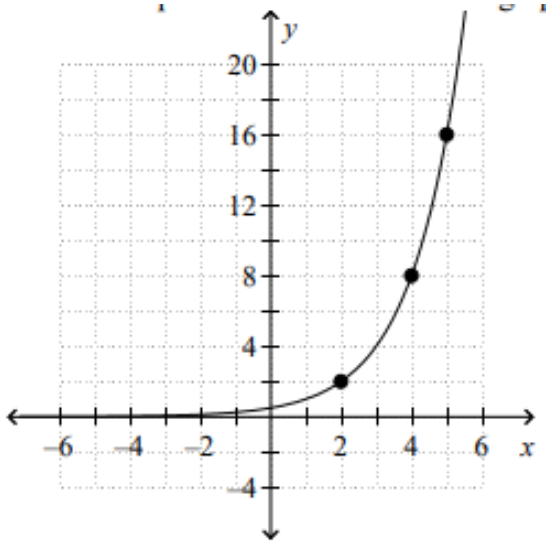
(A) The graphs of exponential functions never exceed the graphs of linear and quadratic functions

(B) The graphs of exponential functions always exceed the graphs of linear and quadratic functions

(C) The graphs of exponential functions eventually exceed the graphs of linear and quadratic functions.

(D) The graphs of exponential functions eventually exceed the graphs of linear functions but not quadratic functions.

67 Write an exponential function for the graph.



(A) $y = \frac{1}{2}(2)^x$

(B) $y = 2\left(\frac{1}{2}\right)^x$

(C) $y = \left(2 \cdot \frac{1}{2}\right)^x$

(D) $y = 2(5)^x$

---

68 In the second quadrant, which of the trig functions would be negative? Select all that apply!

[A] sine

[B] cosine

[C] tangent

[D] cosecant

[E] secant

[F] cotangent

---

69 Which of the following trig functions are NOT directly related in the same Pythagorean Identity

(A) sin and cos

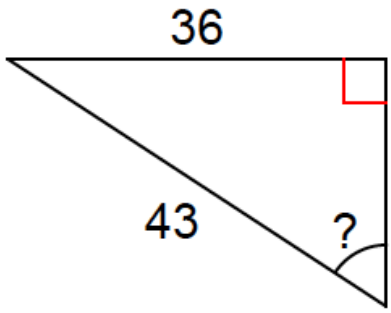
(B) tan and cot

(C) tan and sec

(D) cot and csc

---

70 Find the measure of the indicated ***angle*** to the nearest degree.



$? =$ ☐

ℹ Be sure to include the degree symbol in your answer. (X°)

---

71 Find the ***angle measure*** to the nearest degree.

$\tan(V) = 7.1154$

$V =$ ☐

ℹ Be sure to include the degree symbol in your answer. (X°)

---

72 Point $P(-8, -15)$ is a point on the terminal side of θ in standard position.
Enter the **exact**, simplified value of each of the six trig functions for θ.
Then find θ in both radians and degrees.

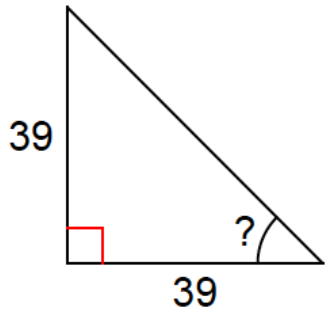
$\sin(\theta)$	☐
$\cos(\theta)$	☐
$\tan(\theta)$	☐
$csc(\theta)$	☐
$sec(\theta)$	☐
$cot(\theta)$	☐

$\theta =$ ☐ radians

$\theta =$ ☐ degrees

---

73 Find the measure of the indicated ***angle*** to the nearest degree.



? =

Be sure to include the degree symbol in your answer. (X°)

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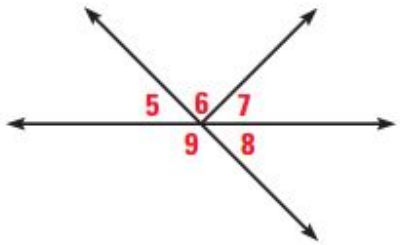
74 Determine whether the angles are adjacent angles, a linear pair, or vertical angles.

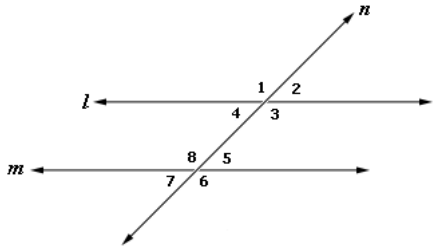
Some pairs of angles may have more than one relationship.



Angle	Adjacent angles	Linear pair	Vertical angles
$\angle 5$ and $\angle 6$	☐	☐	☐
$\angle 5$ and $\angle 9$	☐	☐	☐
$\angle 5$ and $\angle 8$	☐	☐	☐

---

75 Which pairs of angles are alternate exterior angles?



A $\angle 1, \angle 6$

B $\angle 2, \angle 4$

C $\angle 2, \angle 7$

D $\angle 3, \angle 6$

E $\angle 3, \angle 8$

F $\angle 4, \angle 8$

---

76 Complementary angles

(A) are congruent

(B) add up to 90 degrees

(C) add up to 180 degrees

(D) add up to 360 degrees

---

77 Supplementary angles

(A) are congruent

(B) add up to 90 degrees

(C) add up to 180 degrees

(D) add up to 360 degrees

---

78 Vertical angles

(A) are congruent

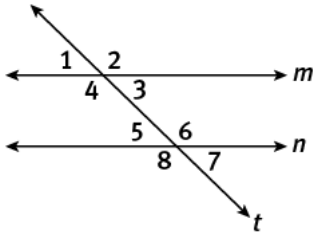
(B) add up to 90 degrees

(C) add up to 180 degrees

(D) add up to 360 degrees

---

79 Given m || n, which pair of angles are not vertical angles?



(A) <1 & <2

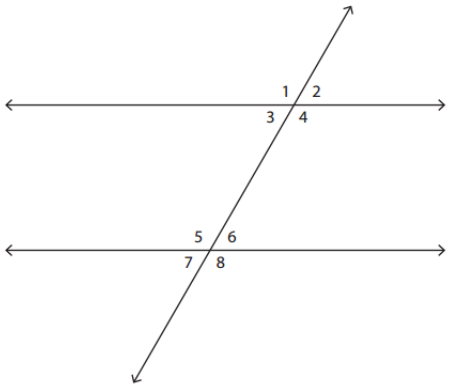
(B) <2 & <4

(C) <5 & <7

(D) <6 & <8

---

80 Match the following pair of angles with their respective definitions.



$\angle 3$ and $\angle 7$	
$\angle 2$ and $\angle 7$	
$\angle 4$ and $\angle 5$	
$\angle 3$ and $\angle 6$	

DRAG & DROP THE ANSWER

GROUP 1

- Alternate Interior Angles
- Corresponding Angles
- Alternate Exterior Angles
- Alternate Interior Angles

---

81 Match the following angles with their appropriate description.

Adjacent angles	
Complementary angles	
Supplementary angles	

DRAG & DROP THE ANSWER

- Two angles whose sum is 90 degree
- Two angles that have a common vertex and a shared side with no common interior points.
- Two angles whose sum is 180 degree

---

82 Determine which of the following pair of angles are complementary, supplementary, or neither.

Pair of angles	Complementary angles	Supplementary angles	Neither
135° and 45°	☐	☐	☐
55° and 35°	☐	☐	☐
55° and 45°	☐	☐	☐
77° and 13°	☐	☐	☐

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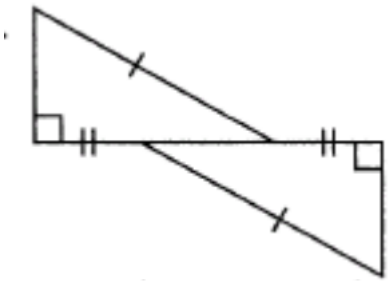
83 Which triangle congruence theorem could you use to prove the following triangles congruent?



(A) Side Angle Side

(B) Angle Side Side

(C) Hypotenuse Leg Theorem

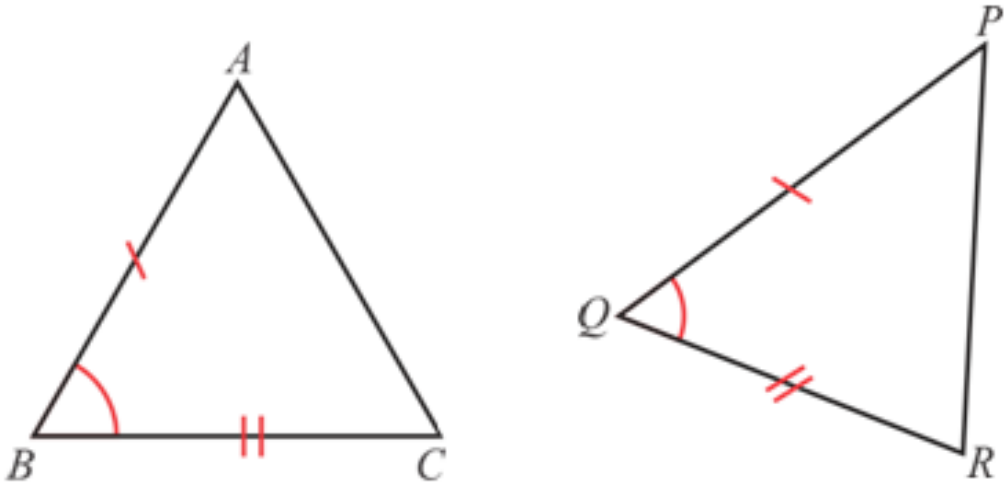
(D) Angle Angle Side

---

84 In the following figure, determine the congruence rule by which the triangles are congruent to each other.

DRAG & DROP THE ANSWER

- Angle-Side-Angle
- Side-Side-Side
- Side-Angle-Side
- Angle-Angle-Side



Congruence rule: [ ]

85 Using the following figure, determine the similarity ratio of $\triangle ABC$ to $\triangle PQR$.

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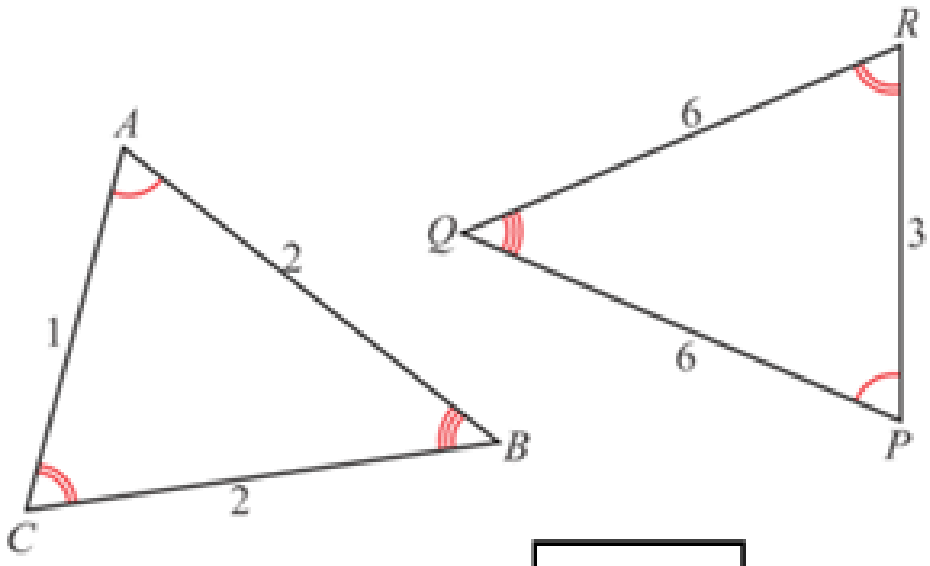
$\frac{1}{3}$

3

$\frac{2}{3}$



Similarity ratio:

86 **Directions - use the following congruence statement to tell if each statement is true or false:**

$\triangle ABC \cong \triangle MTR$

$\angle M \cong \angle A$	True	False
$\angle B \cong \angle R$	True	False
$\overline{CA} \cong \overline{MT}$	True	False
$\overline{BC} \cong \overline{TR}$	True	False

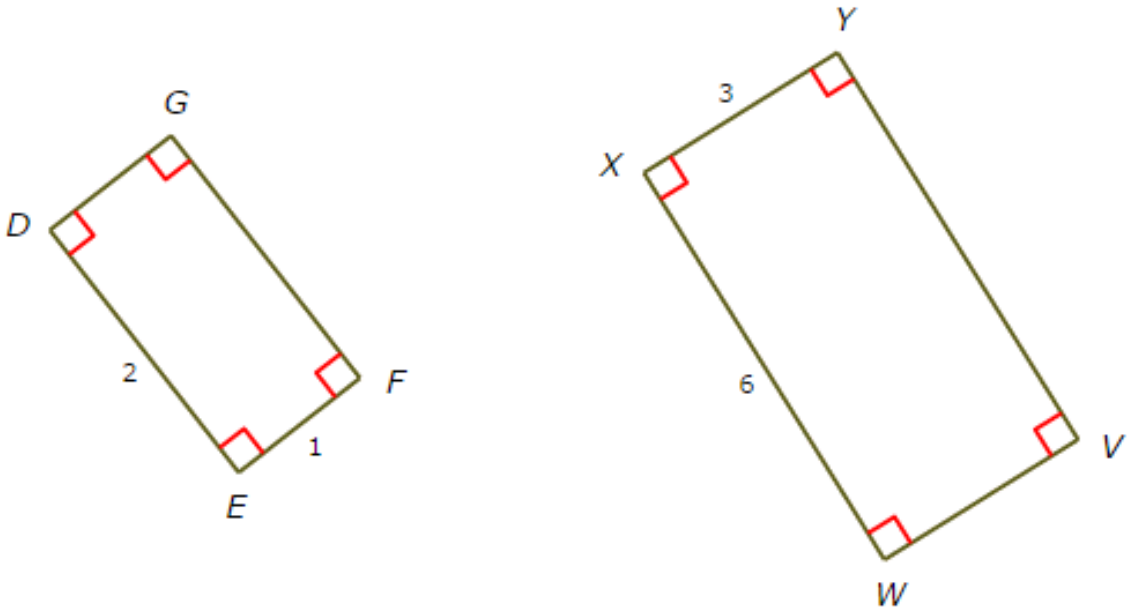
87 The two polygons shown below are similar. Complete the similarity statement given below.

DRAG & DROP THE ANSWER

$VWXY$

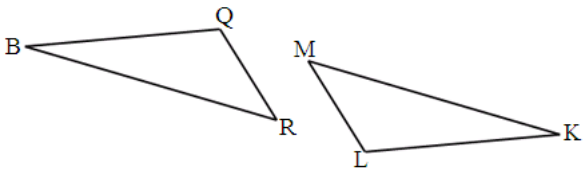
$VYXW$

$XYVW$



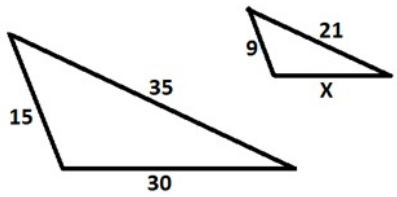
88 Consider the figure shown below. Use the fact that $\triangle BQR \cong \triangle KLM$ to complete the congruence table shown below.

$DEFG \sim$



Parts of triangle BQR	Parts of triangle KLM
B	1
RB	2
R	M
QR	3

89 **The following triangles are similar. Which of the proportions could be used to solve for x:**



A $\frac{15}{9} = \frac{12}{x}$

B $\frac{21}{x} = \frac{35}{30}$

C $\frac{15}{x} = \frac{35}{21}$

D $\frac{30}{x} = \frac{15}{35}$

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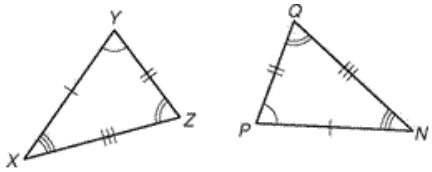
90 Which congruence statement correctly indicates that the two triangles at right are congruent?



(A) $\triangle XYZ \cong \Delta NQP$

(B) $\triangle XYZ \cong \Delta QNP$

(C) $\triangle XYZ \cong \Delta NPQ$

(D) $\triangle XYZ \cong \Delta PQN$

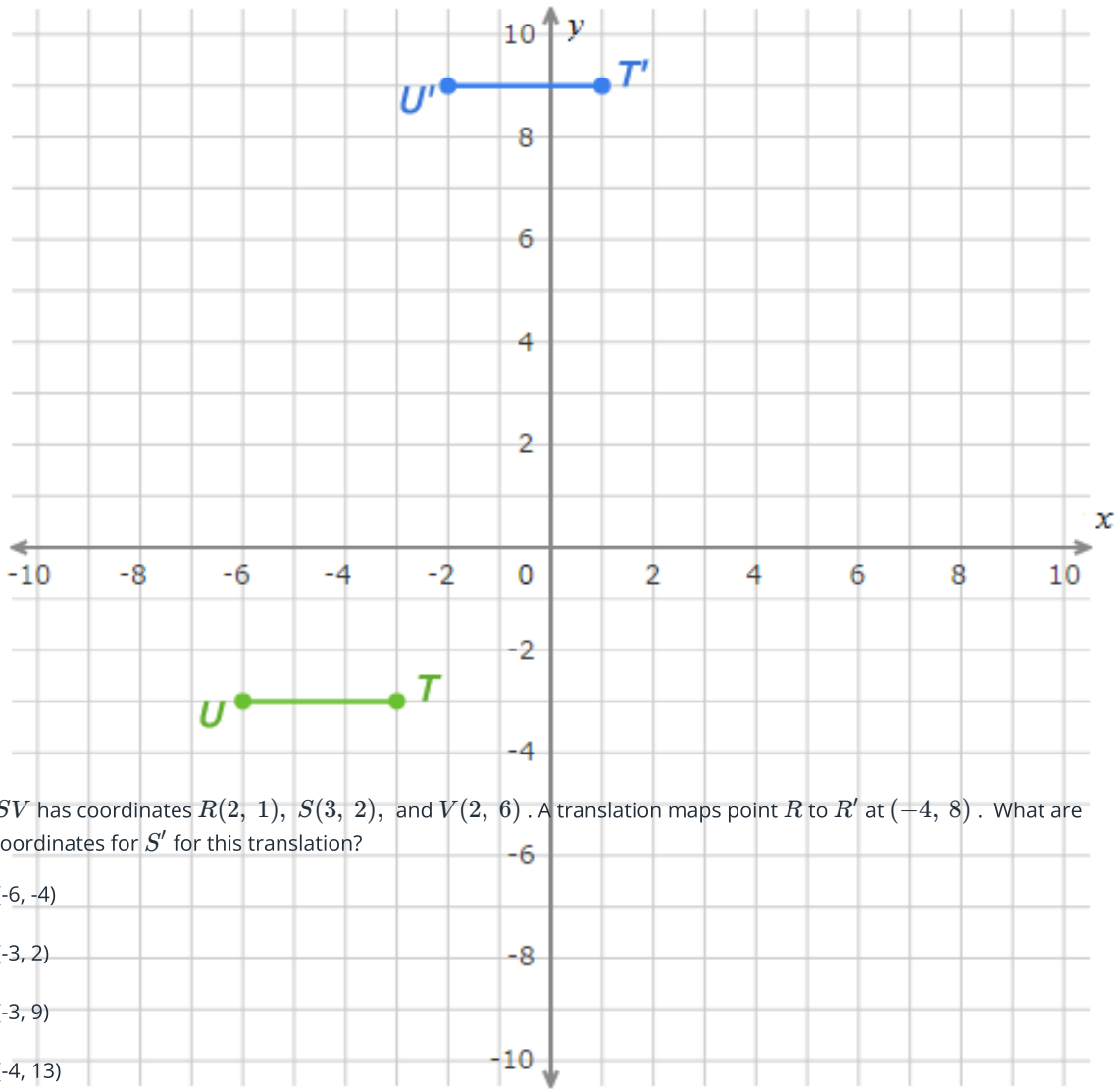
---

91 $\overline{T'U'}$ is a translation of $\overline{TU}$.

Describe the series of translations that move $\overline{TU}$ to $\overline{T'U'}$.

DRAG & DROP THE ANSWER

- 4 units right and 10 units up
- 4 units down and 12 units up
- 4 units right and 12 units up
- 4 units left and 12 units down



92 $\triangle RSV$ has coordinates $R(2,\ 1),\ S(3,\ 2),$ and $V(2,\ 6)$. A translation maps point R to R' at $(-4,\ 8)$. What are the coordinates for S' for this translation?

(A) (-6, -4)

(B) (-3, 2)

(C) (-3, 9)

(D) (-4, 13)

Translation rule:

93 Which rule describes a translation 3 units down?

(A) $(x,\ y) \rightarrow (x,\ y+3)$

(B) $(x,\ y) \rightarrow (x+3,\ y+3)$

(C) $(x,\ y) \rightarrow (x,\ y-3)$

(D) $(x,\ y) \rightarrow (x,\ -3y)$

94 The point $(-3, 15)$ undergoes a translation of 9 units right and 10 units down. What are the coordinates of the new point?

(A) $(-12, 10)$

(B) $(-12, 5)$

(C) $(6, 10)$

(D) $(6, 5)$

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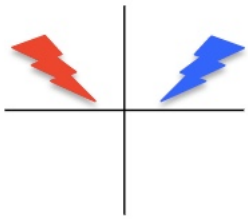
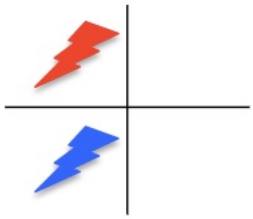
95 Which of the following shows a reflection over the x-axis?

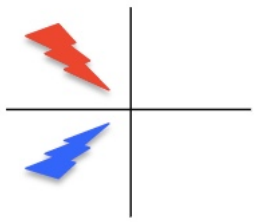
(A)



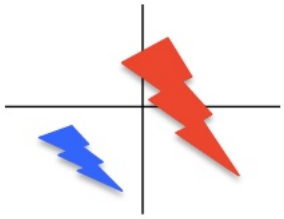
(B)



(C)

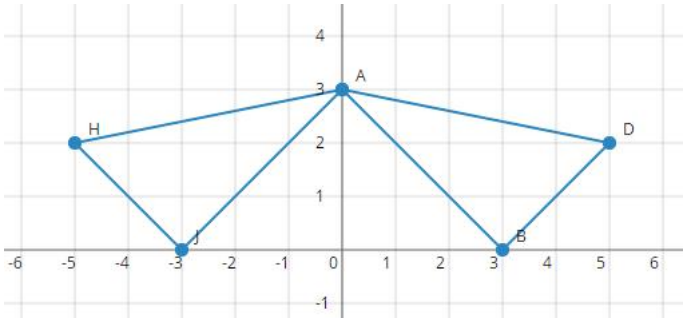


(D)



---

96 If $\triangle AHJ \cong \triangle ADB$, choose the line of reflection between the two congruent triangles.



(A) y axis

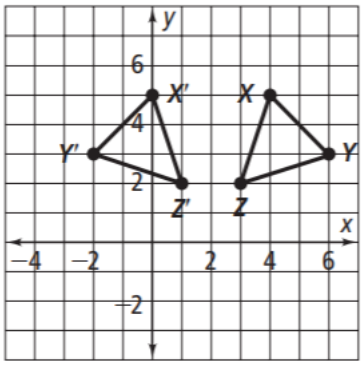
(B) x axis

(C) x = 3

(D) y = 3

---

97 In the graph below, what is the line of reflection for $\triangle XYZ$ and $\triangle X'Y'Z'$?



(A) the x-axis

(B) the y-axis

(C) x=2

(D) y=2

---

98 After a dilation, triangle $\mathrm{A}(0,0), \mathrm{B}(0,4), \mathrm{C}(6,0)$ becomes triangle $A'(0,0), B'(0,10), C'(15,0)$.

Choose the scale factor for this dilation.

(A) 2

(B) 2.5

(C) 1.5

(D) 3

---

99 Kyle performs a transformation on a triangle. The resulting triangle is similar but not congruent to the original triangle.

Which transformation did Kyle perform on the triangle?

(A) dilation

(B) reflection

(C) rotation

(D) translation

---

100 **Using the following dilated coordinates of a triangle choose the appropriate scale factor.**

$\mathrm{J}:(2,4) \rightarrow \mathrm{J}'(4,8)$
$\mathrm{K}:(1,1) \rightarrow \mathrm{K}'(2,2)$
$\mathrm{L}:(4,0) \rightarrow \mathrm{L}'(8,0)$

(A) 5

(B) 4

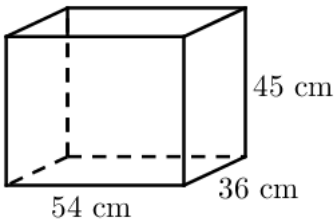
(C) 3

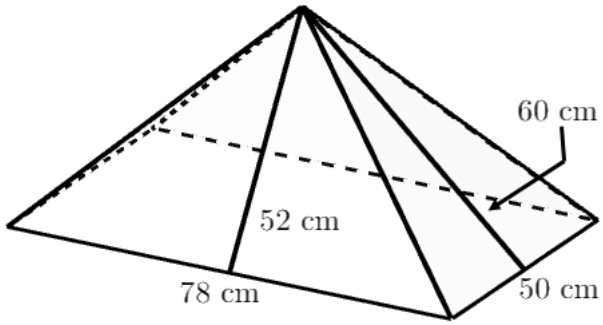
(D) 2

---

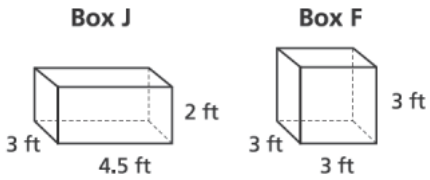
101 What is the difference of the surface areas of the figures shown? Note: The figures are not drawn to scale.

The difference of the surface areas is _____ cm^2.





102 Two types of shipping boxes are shown below.



What is the difference in the surface areas, in square feet, of the two boxes?

(A) 2

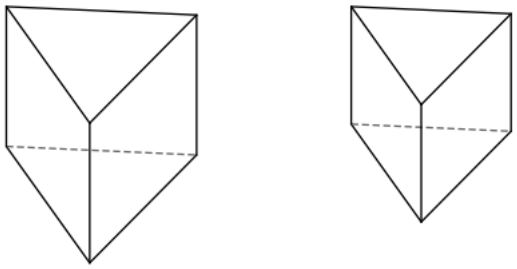
(B) 3

(C) 21

(D) 30

---

103 The pair of figures is similar. Find the scale factor of the figure on the left to the figure on the right. Also find the ratio of surface areas, and ratio of volumes.



$V = 7546\ yd^3$

$V = 1408\ yd^3$

Scale Factor: k =

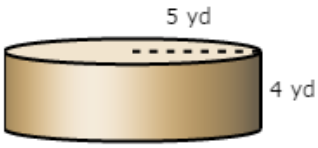
Surface Area Ratio:

Volume Ratio:

---

104 What is the volume of the cylinder?

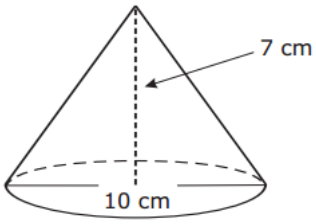
Use $\pi = 3.14$



Volume = cubic yards.

---

105 What is the ***approximate*** volume of the cone below?



(A) $70\ \text{cm}^3$

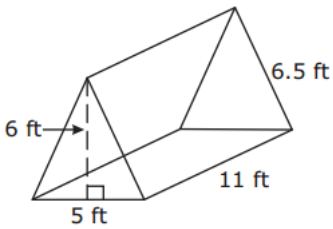
(B) $183\ \text{cm}^3$

(C) $549\ \text{cm}^3$

(D) $733\ \text{cm}^3$

---

106 What is the volume of this triangular right prism?



(A) $165\ \text{ft}^3$

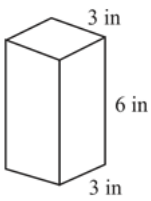
(B) $330\ \text{ft}^3$

(C) $1,073\ \text{ft}^3$

(D) $2,145\ \text{ft}^3$

---

107 Find the volume of the prism.



(A) $18\ \text{in}^3$

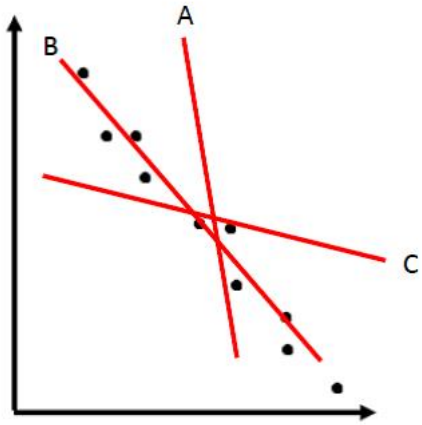
(B) $54\ \text{in}^3$

(C) $52\ \text{in}^3$

(D) $90\ \text{in}^3$

---

108 Choose which line represents the line of best fit.



(A) Line A

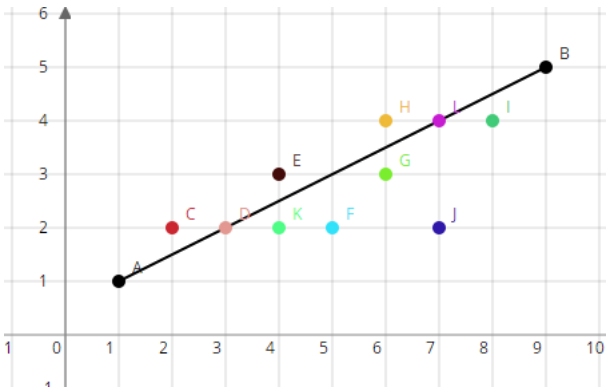
(B) Line B

(C) Line C

(D) There is no line of best fit for this data.

---

109 Find the slope of the line of best fit shown below.



(A) 0.5

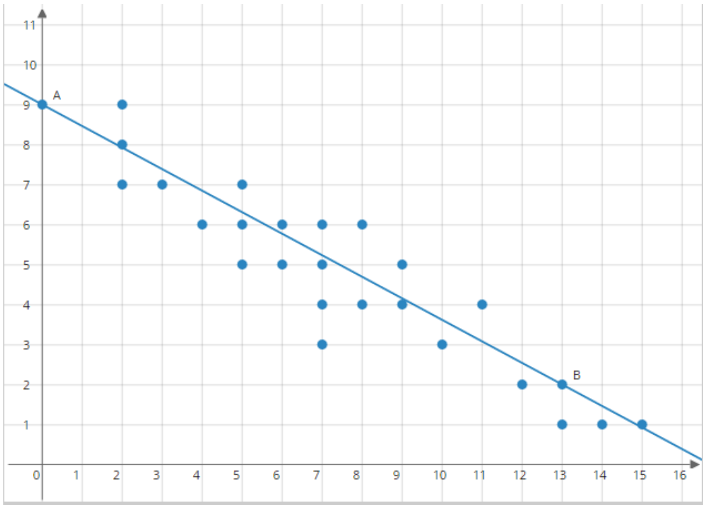
(B) 0.7

(C) 1

(D) 2.5

---

110 Find the equation of the line of best fit for the scatter plot representing bivariate data. Points A & B are on the line of best fit.



(A) y = (-7/13)x + 9

(B) y = (-13/7)x - 9

(C) y = (-7/13)x - 9

(D) y = (7/13)x + 9