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Unit 8.1, Lesson 2: Practice Problems Name _____

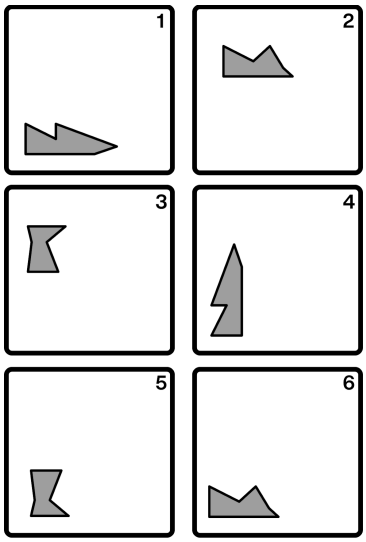
Each of the six cards shows a shape.

1.1 Which two cards represent a rotation?

- ☐ Card 1
- ☐ Card 2
- ☐ Card 3
- ☐ Card 4
- ☐ Card 5
- ☐ Card 6

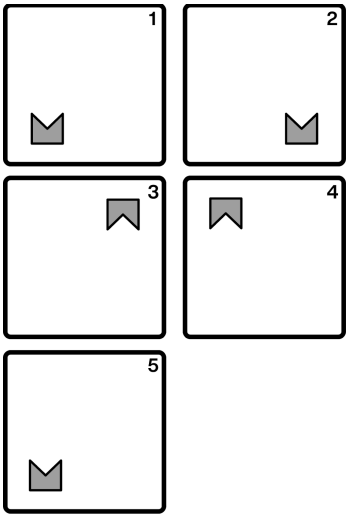
1.2 Which two cards represent a reflection?

- ☐ Card 1
- ☐ Card 2
- ☐ Card 3
- ☐ Card 4
- ☐ Card 5
- ☐ Card 6



2. These five frames show a shape's different positions.

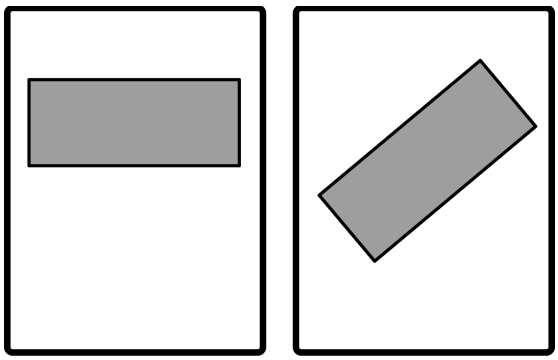
Describe how the shape moves to get from its position in each frame to the next.



3. The rectangle seen in Frame 1 is rotated to a new position in Frame 2.

Select all the ways the rectangle could have been rotated to get from Frame 1 to Frame 2.

- ☐ $40°$ clockwise
- ☐ $40°$ counterclockwise
- ☐ $90°$ clockwise
- ☐ $90°$ counterclockwise
- ☐ $140°$ clockwise
- ☐ $140°$ counterclockwise



Frame 1 **Frame 2**

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Unit 8.1, Lesson 2: Practice Problems

Answer Key

1.1 Cards 1 and 4

1.2 Cards 3 and 5

2. *Responses vary.*
   - To get from Position 1 to Position 2, the shape moves to the right.
   - To get from Position 2 to Position 3, the shape flips over a horizontal line.
   - To get from Position 3 to Position 4, the shape moves to the left.
   - To get from Position 4 to Position 5, the shape flips over a horizontal line again, returning to its original position in Position 1.

3. $40°$ counterclockwise
   $140°$ clockwise

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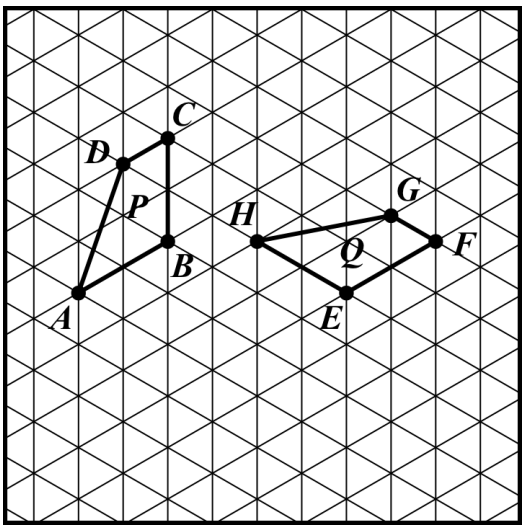
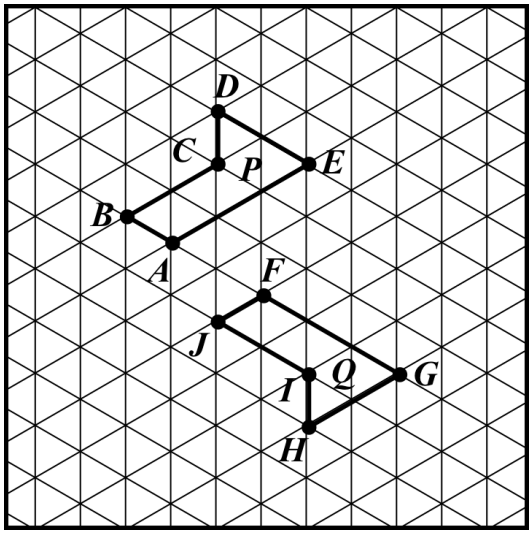
Unit 8.1, Lesson 3: Practice Problems Name _____

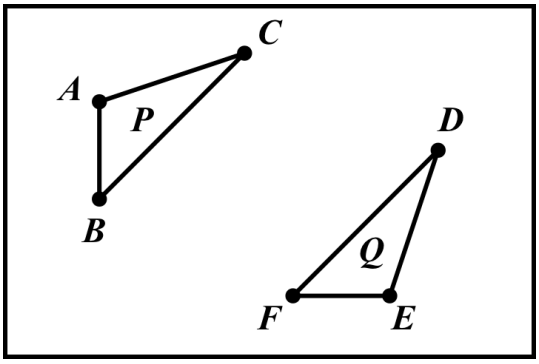
1.1 Describe a sequence of translations, rotations, and reflections that takes polygon P to polygon Q.



1.2 Describe a sequence of translations, rotations, and reflections that takes polygon P to polygon Q.



1.3 Describe a sequence of translations, rotations, and reflections that takes polygon P to polygon Q.



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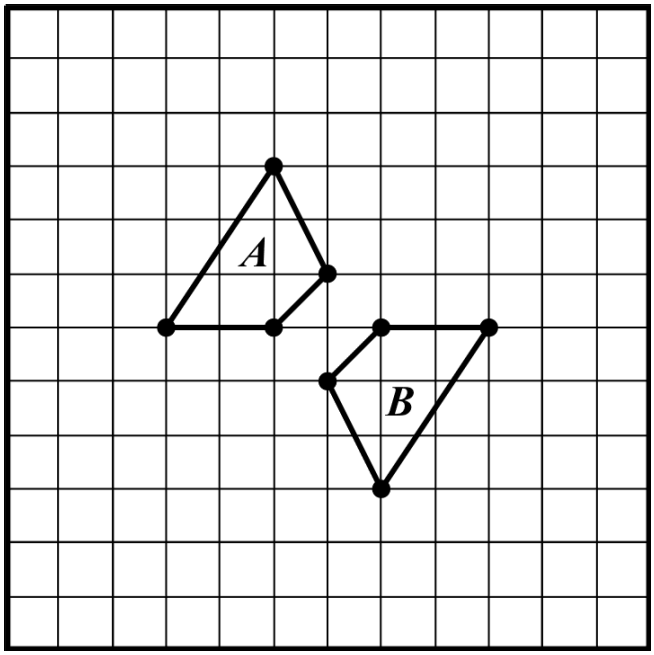
Unit 8.1, Lesson 3: Practice Problems

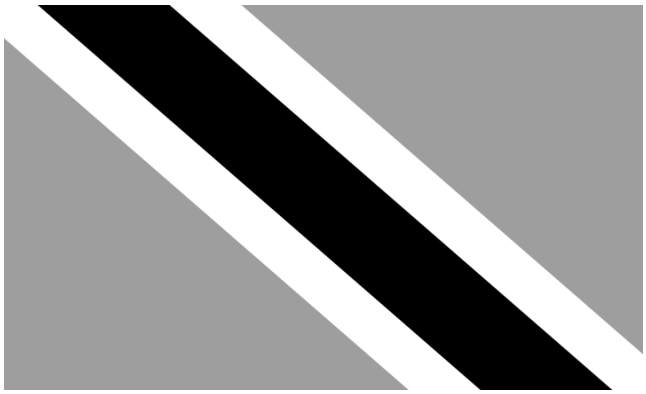
2. Jacy says that she can map polygon A to polygon B using only reflections.

   Do you agree with Jacy?



3. Here is the flag of Trinidad and Tobago.

   Describe a sequence of translations, rotations, and reflections that takes the lower-left triangle to the upper-right triangle.



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Unit 8.1, Lesson 3: Practice Problems

Answer Key

1.1 *Responses vary.* A is translated to H, followed by a rotation $60°$ clockwise with center H.

1.2 *Responses vary.* Polygon $ABCDE$ is reflected over line AE. A is then translated to F, and a rotation of $60°$ clockwise with center F is applied.

1.3 *Responses vary.* A is translated to E. Then a rotation with center E is applied so that B lands on top of F. Finally, the polygon is reflected over line EF.

2. Yes. *Explanations vary.* Reflecting polygon A over the vertical line in the middle of the grid and then over the horizontal line in the middle of the grid takes polygon A to polygon B.

3. *Responses vary.*
   - $180°$ rotation around the center point of the flag.
   - The lower-left triangle is first translated to the right so that it shares an edge with the upper-right triangle. Then it's rotated $180°$ around the midpoint of the common side.

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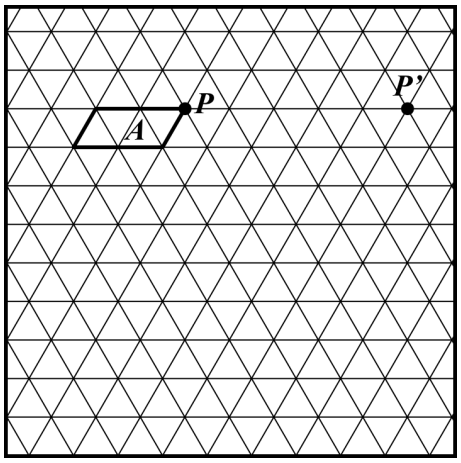
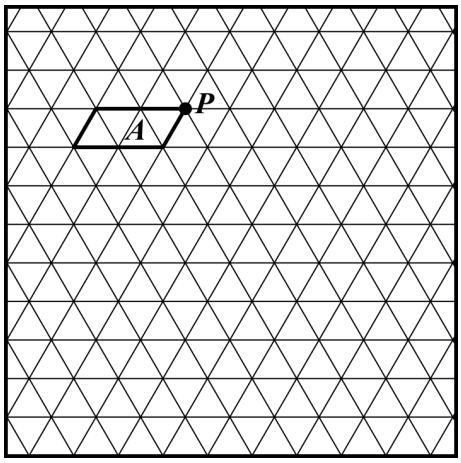
Unit 8.1, Lesson 4: Practice Problems Name _____

Draw the following information.

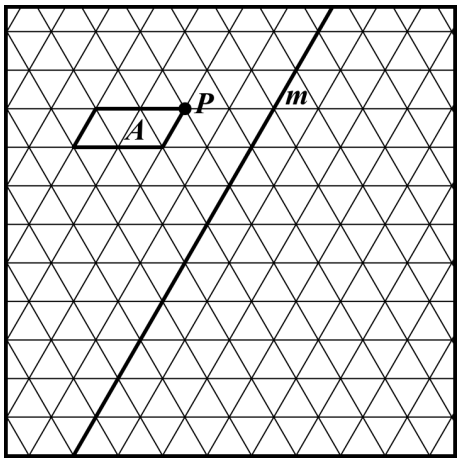
1.1 A translation of figure A that takes P to P'.



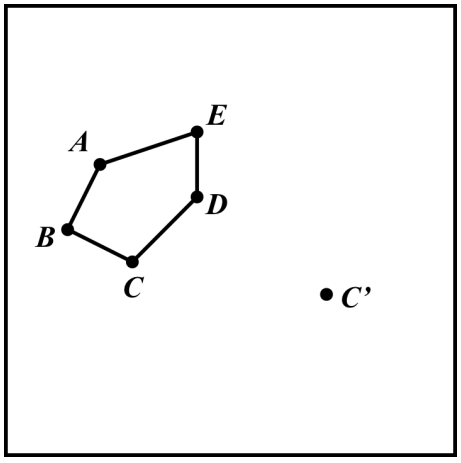
1.2 A $60°$ counterclockwise rotation of figure A using center P.



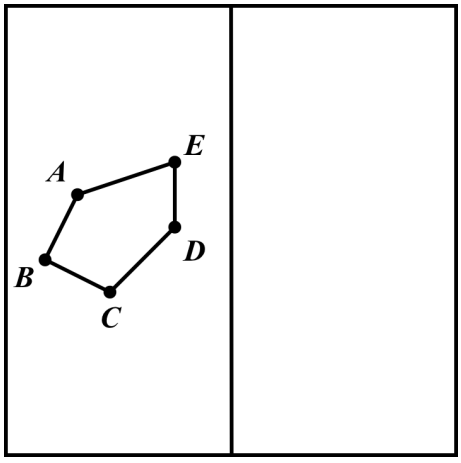
1.3 A reflection of figure A across line m .



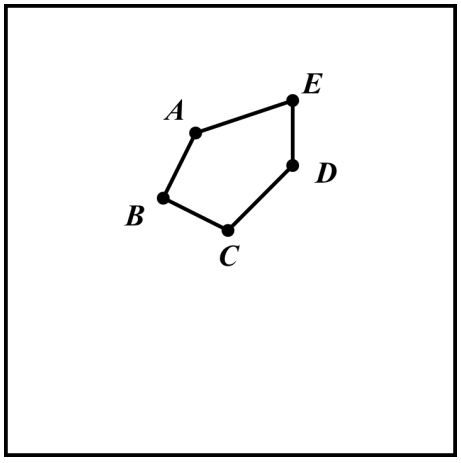
2.1 Translate $ABCDE$ so that C moves to C''.



2.2 Reflect $ABCDE$ using line of reflection m.



2.3 Rotate $ABCDE 180°$ clockwise around C.



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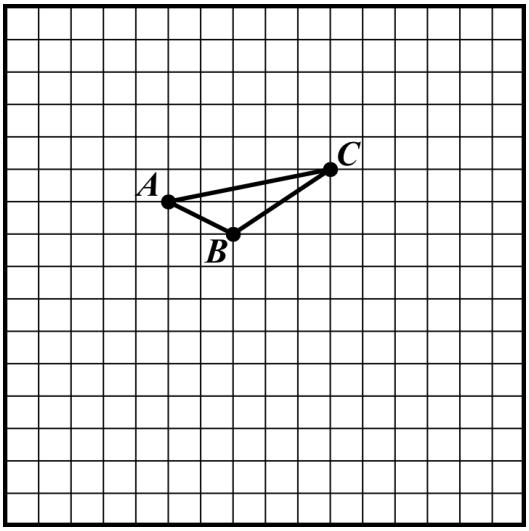
Unit 8.1, Lesson 4: Practice Problems

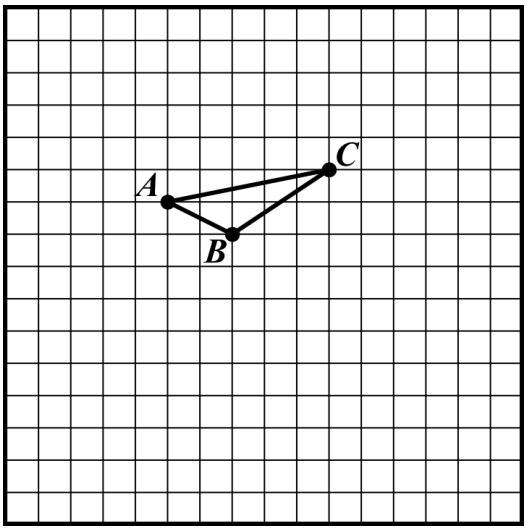
3.1 Draw a rotation of triangle ABC.

Then clearly describe how you did it.



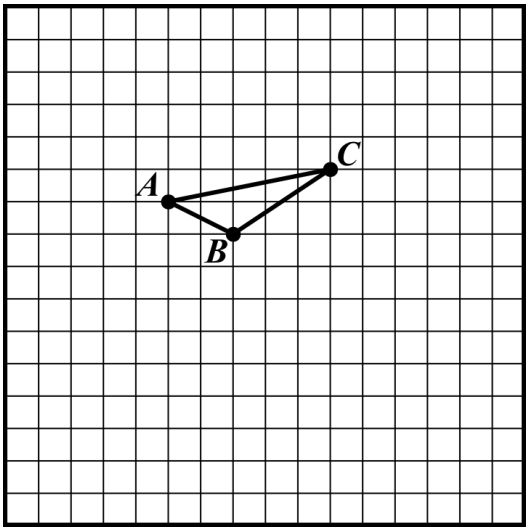
3.2 Draw a translation of triangle ABC.

Then clearly describe how you did it.



3.3 Draw a reflection of triangle ABC.

Then clearly describe how you did it.



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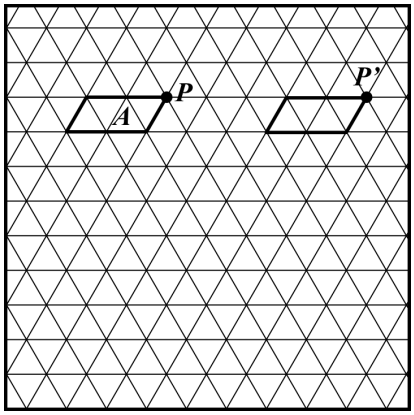
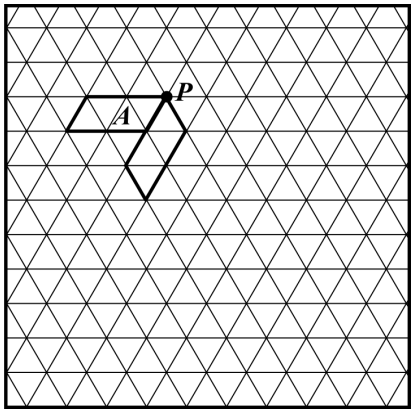
Unit 8.1, Lesson 4: Practice Problems

Answer Key

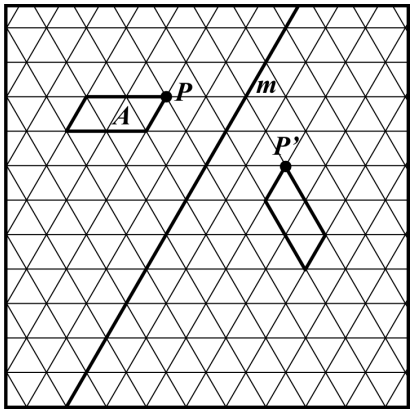
1.1



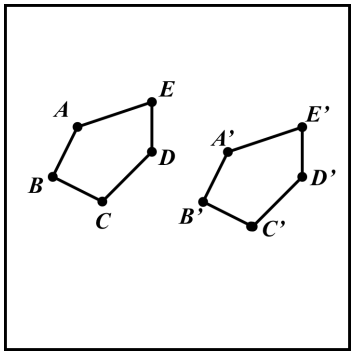
1.2



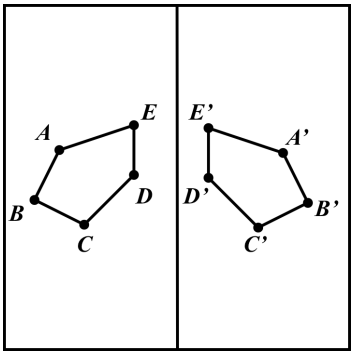
1.3



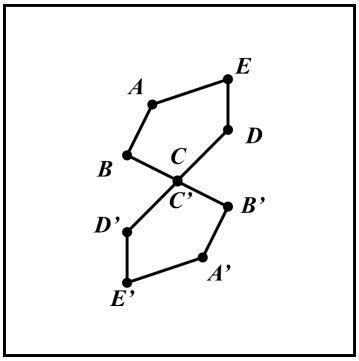
2.1 (From Unit 1, Lesson 2)



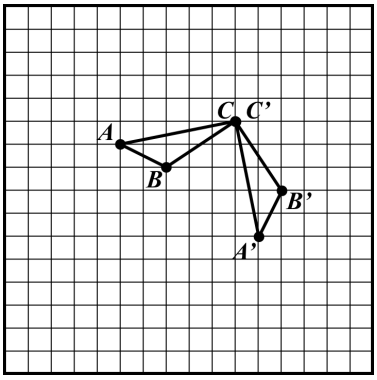
2.2 (From Unit 1, Lesson 2)



2.3 (From Unit 1, Lesson 2)



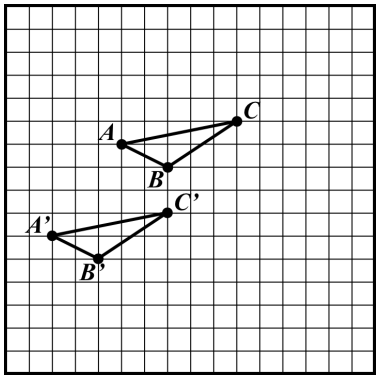
3.1



Responses vary.

- I used a $90°$ rotation counterclockwise with center A.
- I used a $180°$ rotation with center B.

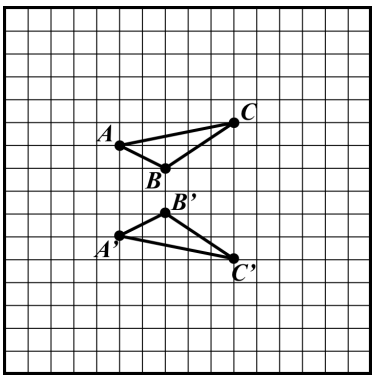
3.2



Responses vary.

The translation is 4 units down and 3 to the left.

3.3



Responses vary.

The reflection is across a horizontal line one unit below point B.

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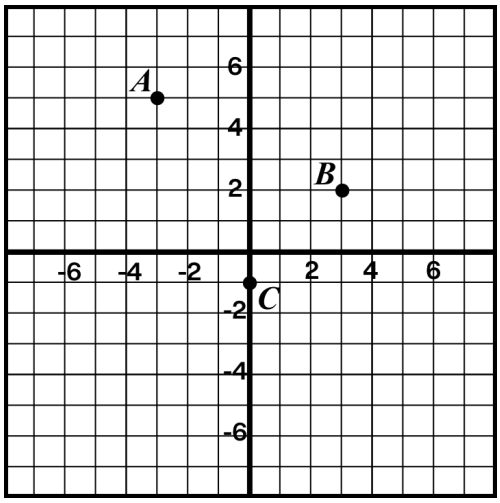
Unit 8.1, Lesson 5: Practice Problems Name _____

1.1 Plot the location of A, B, and C after a translation to the right by 4 units and up 1 unit.

Label the points A', B', and C'.

Then enter the coordinates into the table.

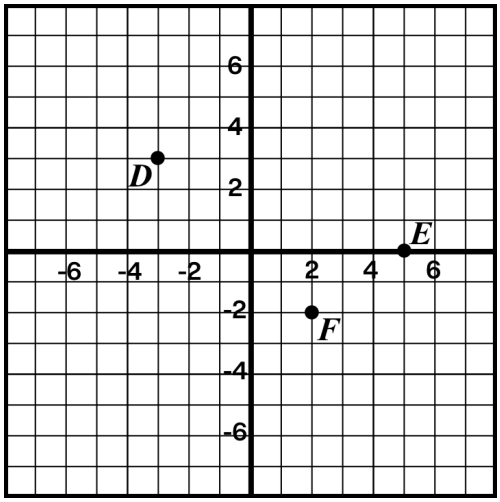


Point	Coordinates
A'	
B'	
C'	

1.2 Plot the location of D, E, and F after a reflection over the y-axis.

Label the points D', E', and F'.

Then enter the coordinates into the table.

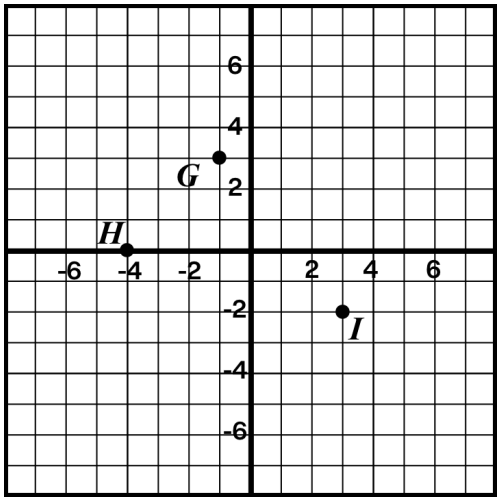


Point	Coordinates
D'	
E'	
F'	

1.3 Plot the location of G, H, and I after a $90°$ clockwise rotation around $0, 0$.

Label the points G', H', and I'.

Then enter coordinates into the table.



Point	Coordinates
G'	
H'	
I'	

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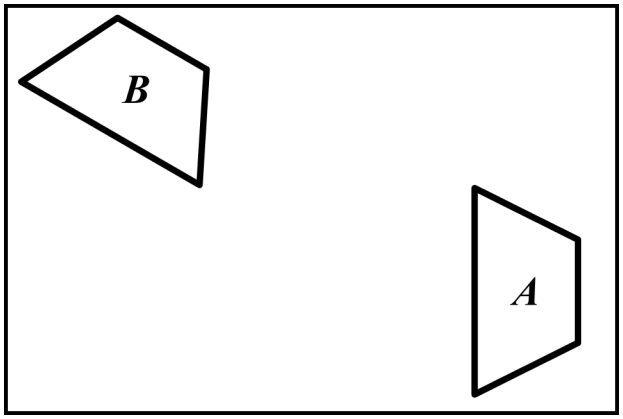
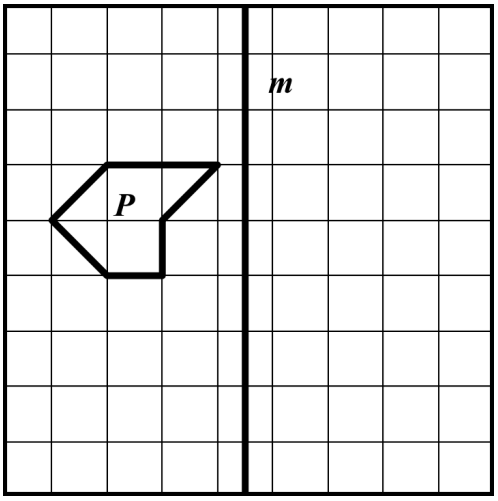
Unit 8.1, Lesson 5: Practice Problems

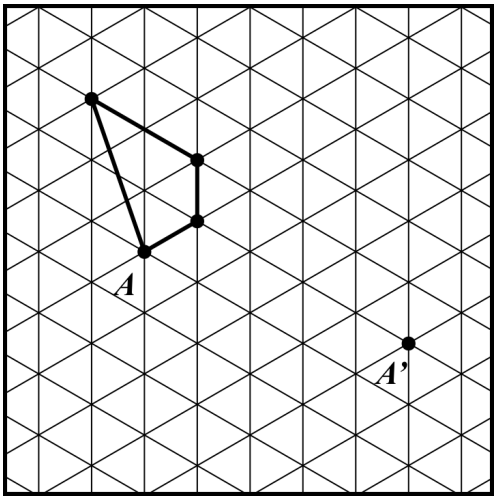
2. Describe a sequence of transformations that takes trapezoid A to trapezoid B.



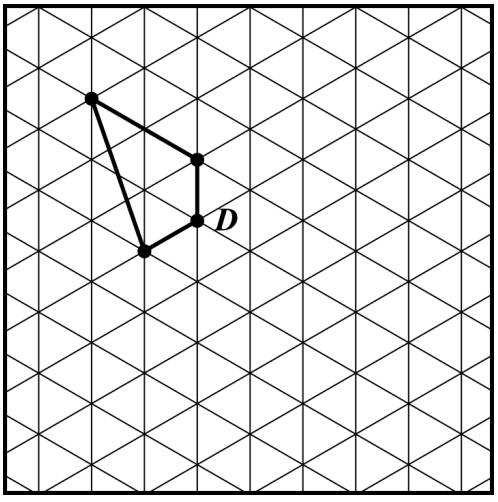
3. Reflect polygon P across line m.



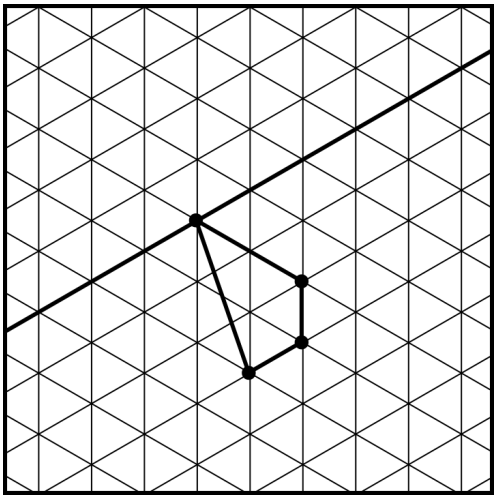
4.1 Translate the shape so that A goes to A'.



4.2 Rotate the shape $180°$ counterclockwise around D.



4.3 Reflect the shape over the line.



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Unit 8.1, Lesson 5: Practice Problems

Answer Key

1.1

- $A' = (1, 6)$
- $B' = (7, 3)$
- $C' = (4, 0)$

1.2

- $D' = (3, 3)$
- $E' = (-5, 0)$
- $F' = (-2, -2)$

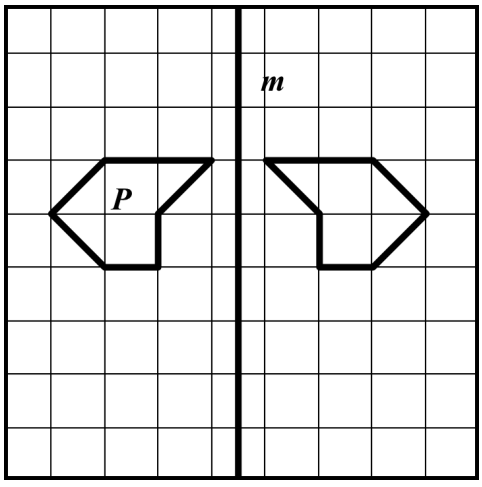
1.3

- $G' = (3, 1)$
- $H' = (0, 4)$
- $I' = (-2, -3)$

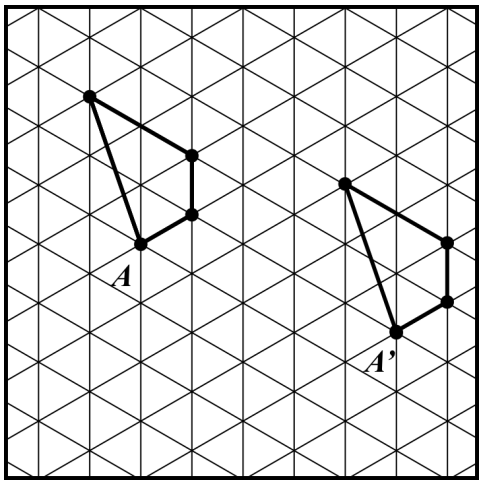
2. *Responses vary.*

Translate A up. Rotate it $60°$ counterclockwise (with the bottom vertex as the center of rotation), and then translate it left.

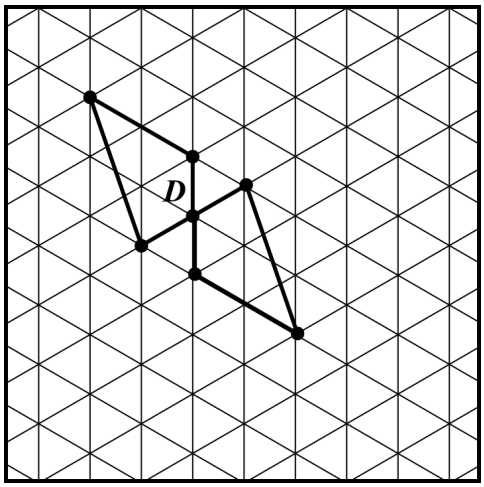
3.



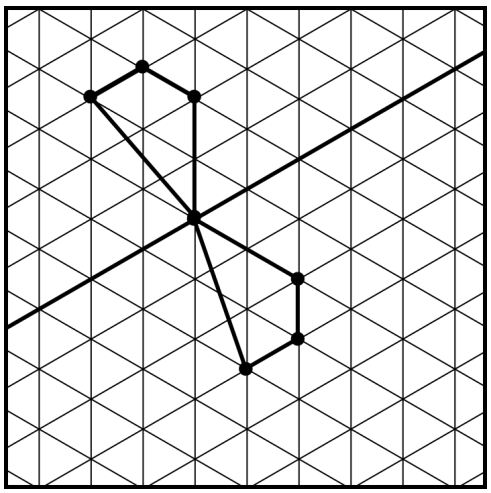
4.1



4.2



4.3



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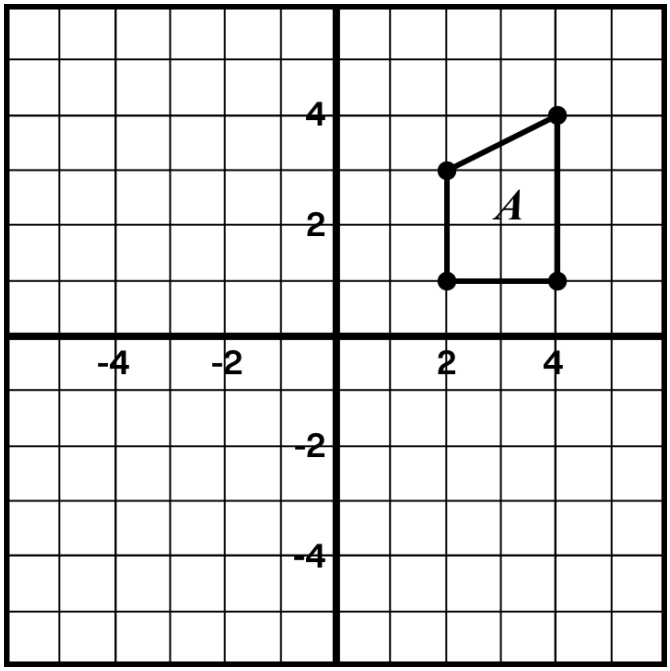
Unit 8.1, Lesson 6: Practice Problems Name _____

1. Here is trapezoid A in the coordinate plane.

   - Reflect A over the y-axis. Label the image B.
   - Reflect B over the x-axis. Label the image C.
   - Reflect C over the x-axis. Label the image D.



2. The point $(-4, 1)$ is rotated $180°$ counterclockwise using center $(-3, 0)$. What are the coordinates of the image? Select one.

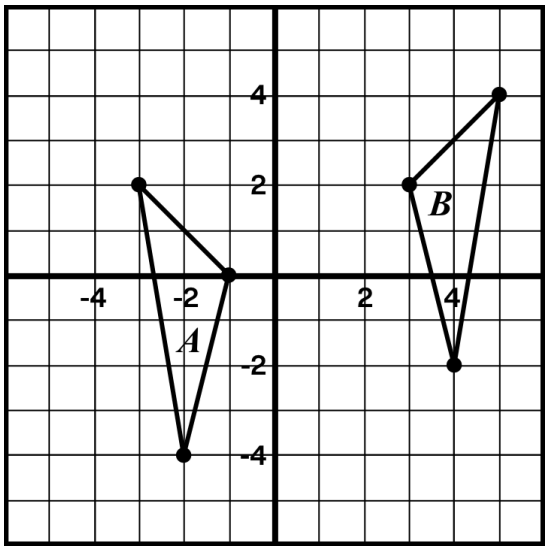
   A. $(-5, 2)$

   B. $(-4, 1)$

   C. $(-2, -1)$

   D. $(4, -1)$

3. Describe a sequence of transformations for which triangle B is the image of triangle A.



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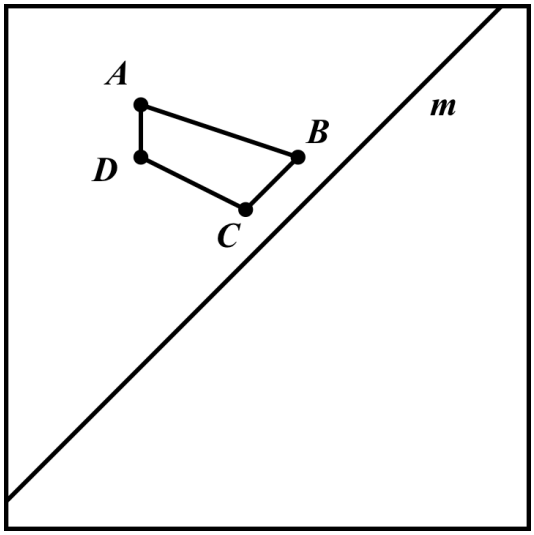
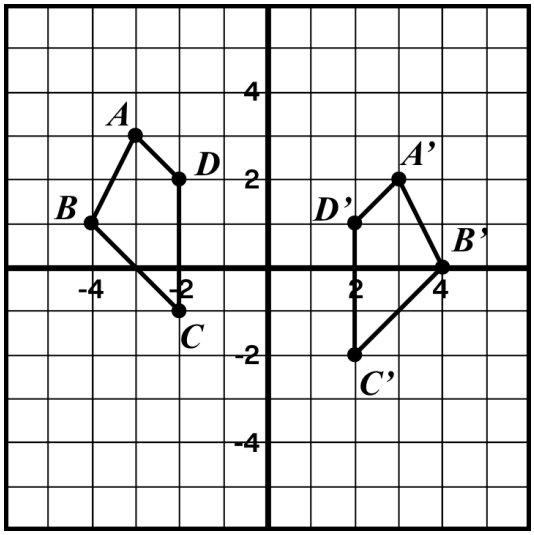
Unit 8.1, Lesson 6: Practice Problems

4. Here is quadrilateral $ABCD$ and line m.

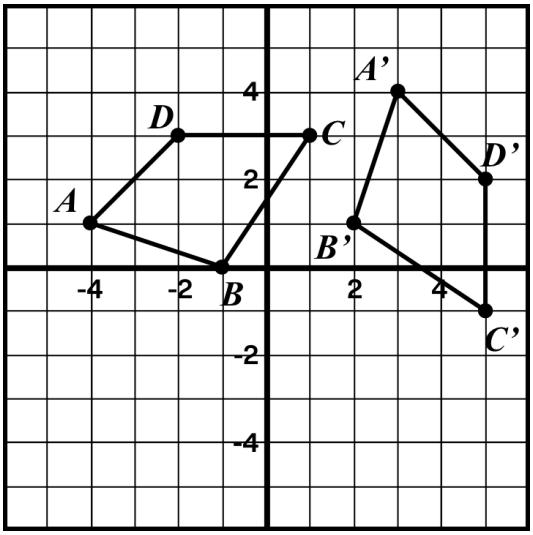
   Draw the image of quadrilateral $ABCD$ after reflecting it across line m.



5.1 Describe a sequence of transformations that takes $ABCD$ to $A'B'C'D'$.



5.2 Describe a sequence of transformations that takes $ABCD$ to $A'B'C'D'$.



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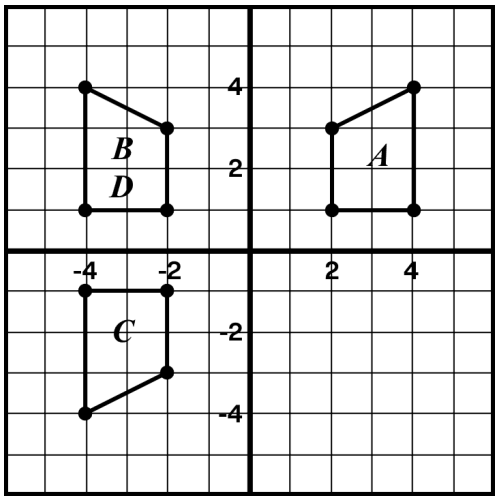
Unit 8.1, Lesson 6: Practice Problems

Answer Key

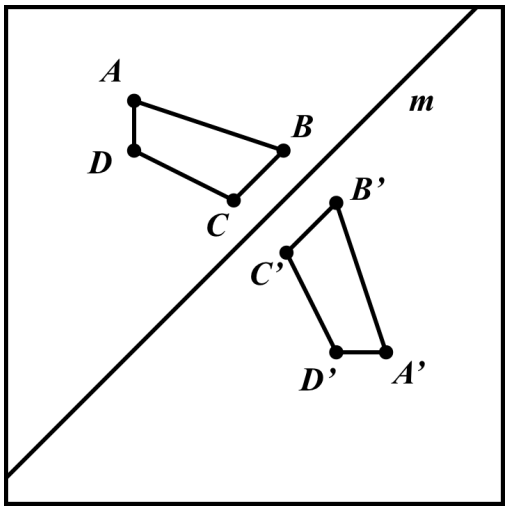
1.



2. C. $(-2, -1)$

3. *Responses vary.* B is the image of A reflected over the y-axis. Then it is translated 2 units to the right and 2 units up.

4. (From Unit 1, Lesson 4)



5.1 Reflect $ABCD$ over the y-axis, and then translate down 1.

5.2 Rotate $ABCD$ $90°$ clockwise with center $B = (-1, 0)$, and then translate $(-1, 0)$ to $(2, 1)$.

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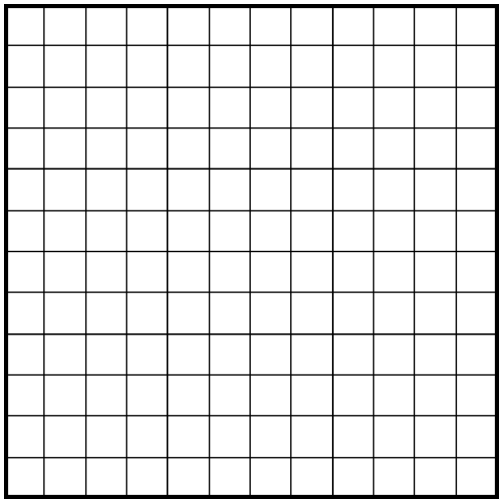
Unit 8.1, Lesson 7: Practice Problems Name _____

1. If two rectangles have the same perimeter, do they have to be congruent?

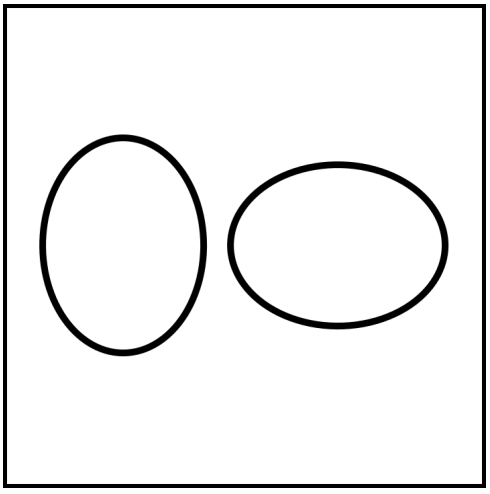
   Explain your thinking.

2. Create two rectangles that have the same area but are not congruent.

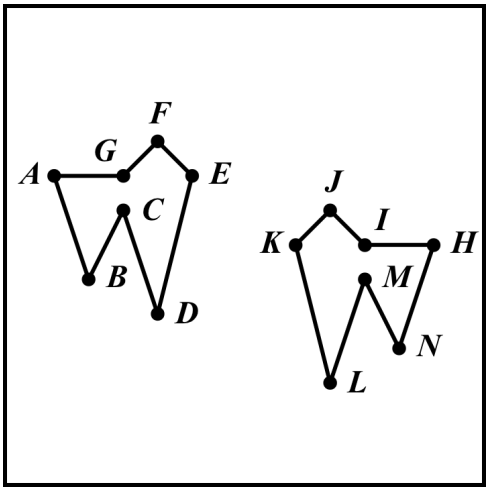


3.1 Do these two shapes appear to be congruent?

Explain your thinking.



3.2 Do these two figures appear to be congruent? Explain your thinking.



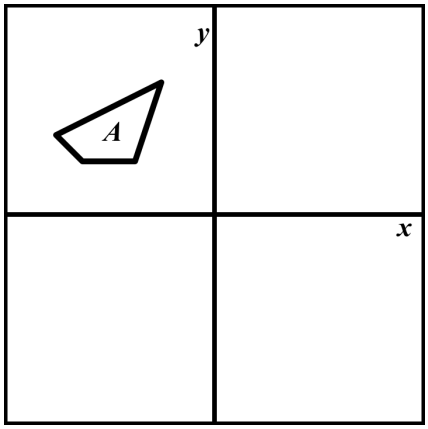
desmos

Unit 8.1, Lesson 7: Practice Problems

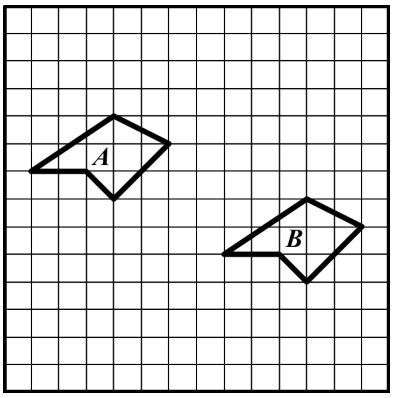
4. Here is quadrilateral A in the coordinate plane.
   - Reflect A over the x-axis. Label the image B.
   - Reflect B over the y-axis. Label the image C.

   Are quadrilaterals A and C congruent?

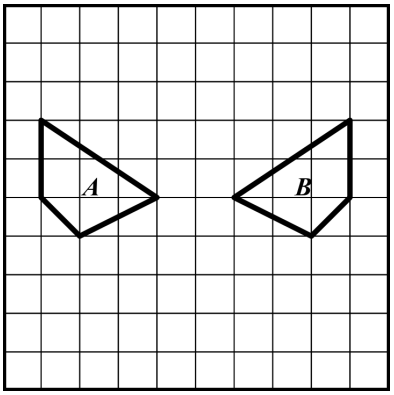
   Explain your thinking.



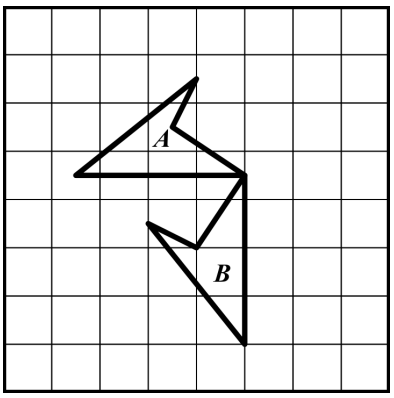
5.1 Describe the transformation that could be applied to polygon A to get polygon B.



5.2 Describe the transformation that could be applied to polygon A to get polygon B.



5.3 Describe the transformation that could be applied to polygon A to get polygon B.



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Unit 8.1, Lesson 7: Practice Problems

Answer Key

1. No.

   Explanations vary. Two non-congruent rectangles can have the same perimeter. For example, a rectangle with side lengths 3 inches and 4 inches is not congruent to a rectangle with side lengths 2 inches and 5 inches. Even though the angles of all rectangles have the same measure, when two figures are congruent, all side lengths and angle measures are the same.

2. *Responses vary.* 2-by-6 rectangle and 3-by-4 rectangle.

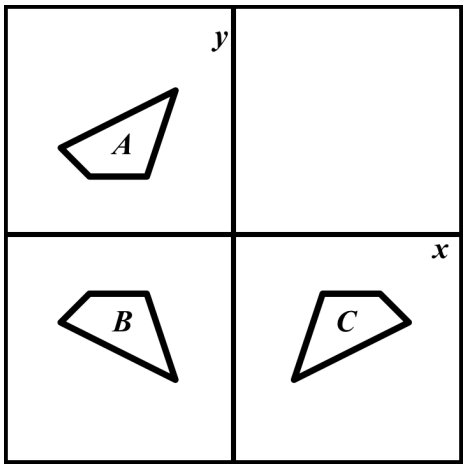
3.1 Yes.

Explanations vary. These appear to be congruent. If the shape on the right is traced, it can be moved over, and it appears to match up perfectly with the shape on the left. This can be done with a rotation ($90°$ clockwise) and then a translation.

3.2 Yes.

Explanations vary. These appear to be congruent. If $ABCDEFG$ is reflected over a vertical line and then translated, it appears to land on top of $HNMLKJI$.

4.



Yes.

Explanations vary. Because there is a rigid transformation taking A to C, the two shapes are congruent.

5.1 (From Unit 1, Lesson 4)

Translation down 3 units and right 7 units.

5.2 (From Unit 1, Lesson 4)

Reflection with a vertical line of reflection halfway between the two polygons.

5.3 (From Unit 1, Lesson 4)

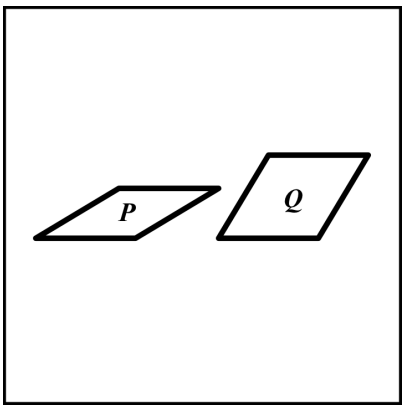
Rotation $90°$ counterclockwise with the vertex shared by the two polygons as the center of rotation.

desmos

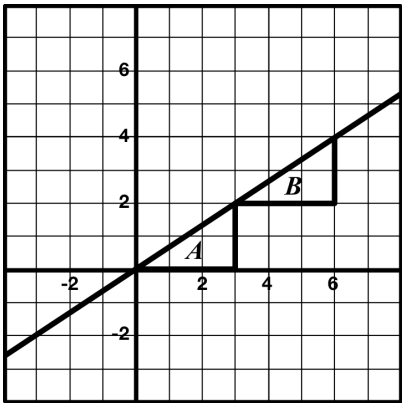
Unit 8.1, Lesson 8: Practice Problems Name _____

1. Is there a rigid transformation taking rhombus P to rhombus Q?

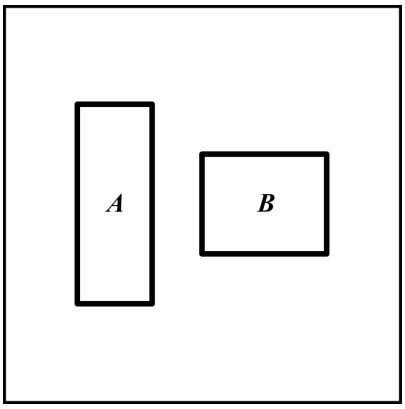
   Explain your thinking.



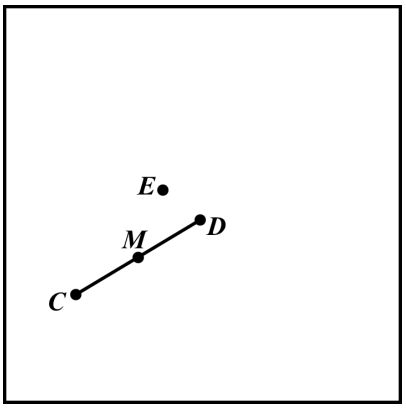
2. Describe a rigid transformation that takes triangle A to triangle B.



3. Is there a rigid transformation taking rectangle A to rectangle B?



4.1 Draw a rotation of segment CD $180°$ around point D.



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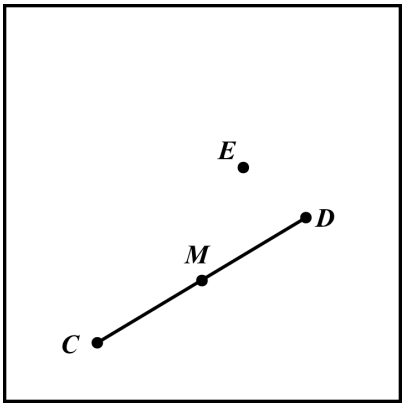
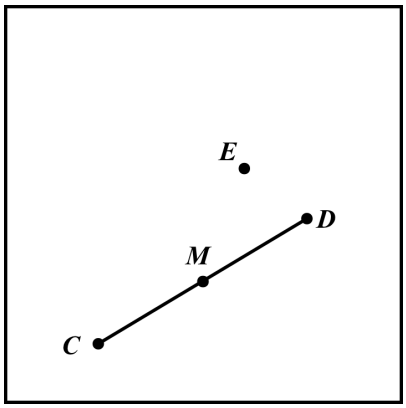
Unit 8.1, Lesson 8: Practice Problems

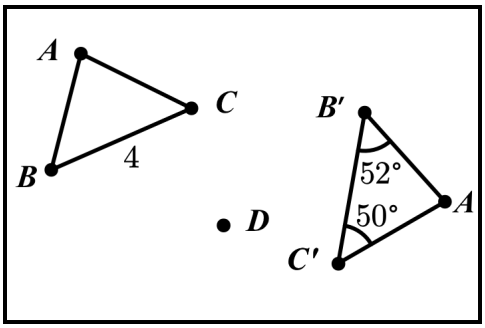
4.2 Draw a rotation of segment CD 180°around point E.



4.3 Draw a rotation of segment CD 180°around point M.



Triangle $A'B'C'$ is an image of triangle ABC after a rotation. The center of rotation is D.



5.1 What is the length of side $B'C'$?

Explain your thinking.

5.2 What is the measure of angle B?

Explain your thinking.

5.3 What is the measure of angle C?

Explain your thinking.

desmos

Unit 8.1, Lesson 8: Practice Problems

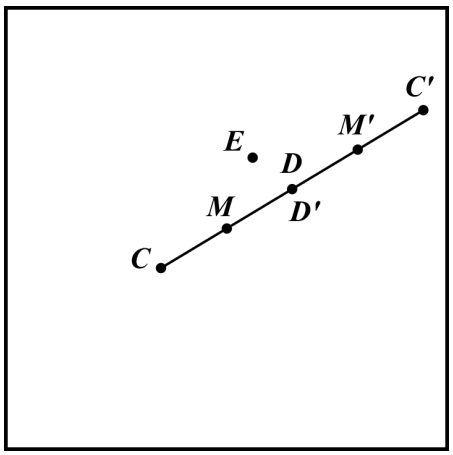
Answer Key

1. No. *Explanations vary.* The angle measures of the two polygons are different, and a rigid transformation must preserve all lengths and angle measures.

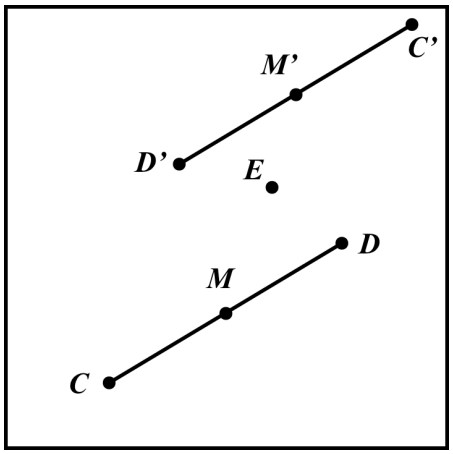
2. Translate 3 units right and 2 units up.

3. No. *Explanations vary.* The side lengths of the two rectangles are different, and a rigid transformation must preserve all lengths and angle measures.

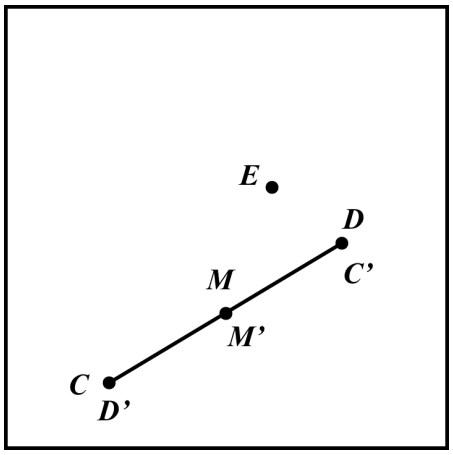
4.1



4.2



4.3



5.1 4 units

Explanations vary. Rotations preserve side lengths, and side $B'C'$ corresponds to side BC under this rotation.

5.2 52°

Explanations vary. Rotations preserve angle measures, and angles B and B' correspond to each other under this rotation.

5.3 50°

Explanations vary. Rotations preserve angle measures, and angles C and C' correspond to each other under this rotation.

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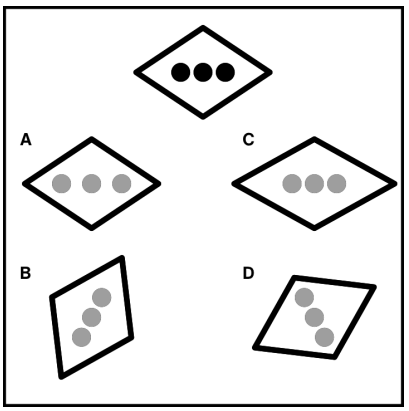
Unit 8.1, Lesson 9: Practice Problems Name _____

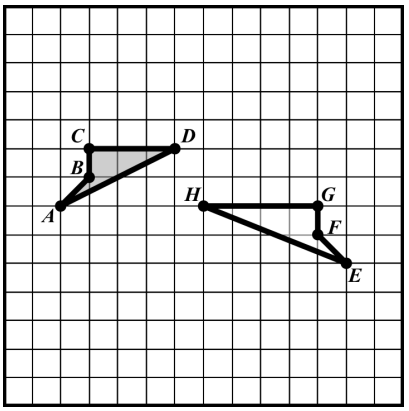
1. Select all of the figures that appear congruent to the top figure.



- ☐ A
- ☐ B
- ☐ C
- ☐ D

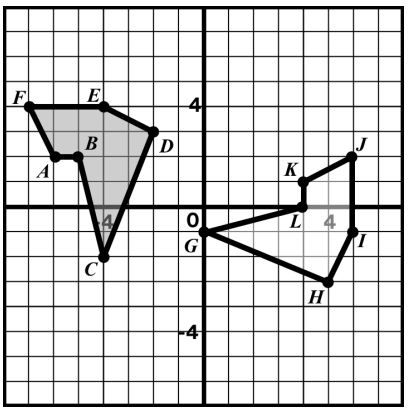
2.1 Are these two shapes congruent?

Explain your thinking.



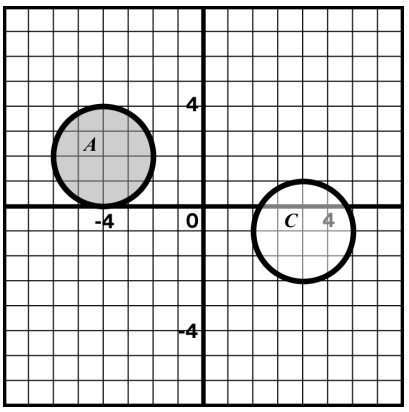
2.2 Are these two shapes congruent?

Explain your thinking.



2.3 Are these two shapes congruent?

Explain your thinking.



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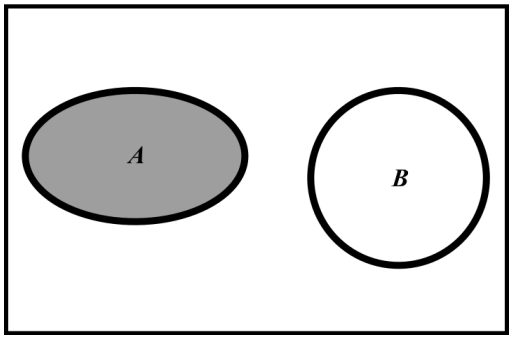
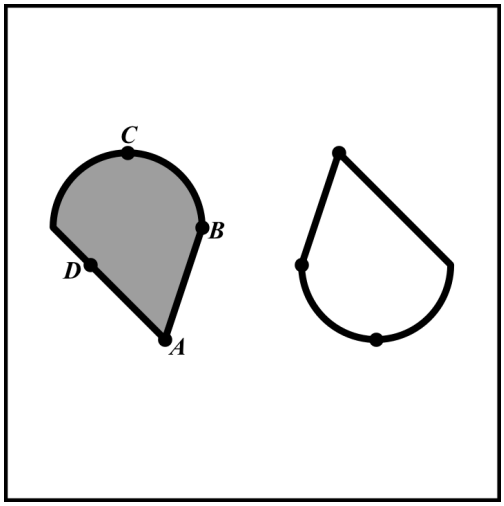
Unit 8.1, Lesson 9: Practice Problems

3. Use measurements to explain why these two figures are not congruent.



These two figures are congruent.



4.1 Label the figure on the right with points A', B', and C' so that they correspond to A, B, and C in the figure on the left.

4.2 If segment AB measures 2 centimeters, how long is segment $A'B'$?

Explain your thinking.

4.3 Plot point D' where you think it is located.

Then explain your thinking.

desmos

Unit 8.1, Lesson 9: Practice Problems

Answer Key

1. ✓ B

2.1 No.

Explanations vary. Segment EH in polygon $EFGH$ is longer than any of the sides in polygon $ABCD$. A, B, and C can be matched up with vertices E, F, and G, but H doesn't match up with D.

2.2 Yes.

Explanations vary. If $ABCDEF$ is rotated $90°$ clockwise around C and then moved 4 units to the right and 1 unit up, it matches up perfectly with $GHIJKL$.

2.3 Yes.

Explanations vary. If the circle on the top left is translated to the right by 8 units and down 3 units, it lands on top of the other circle.

3. *Responses vary.* The rightmost and leftmost points on figure A are further apart than any pair of points on figure B, so these two points cannot correspond to any pair of points on figure B, and the two figures are not congruent.

4.1 Counterclockwise from the top: A', B', C'

4.2 2 centimeters

Explanations vary. The shapes are congruent, and the corresponding segments of congruent shapes are also congruent.

4.3 *Explanations vary.* Because the figures are congruent, point D' will be on the corresponding side and will be the same distance from C' that D is from C. D' can be found by looking for the point on the segment going down and to the right from A' and is the appropriate distance from C'.

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Unit 7.7, Lesson 2: Practice Problems Name _____

Warm-Up

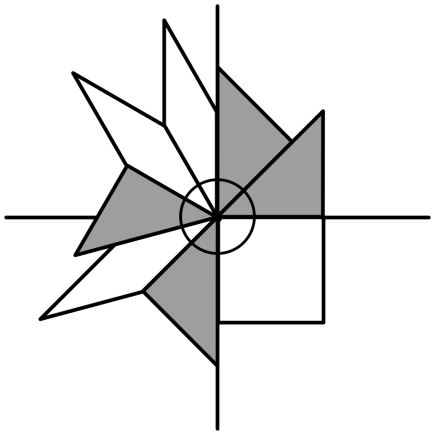
Determine the value of the variable in each equation.

$x + 40 = 180$	$x + 40 = 90$	$2x + 40 = 180$	$2(x + 40) = 180$

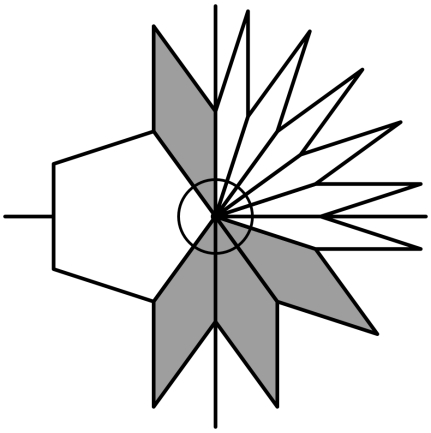
Practice

For each diagram, determine as many angle measures as you can.

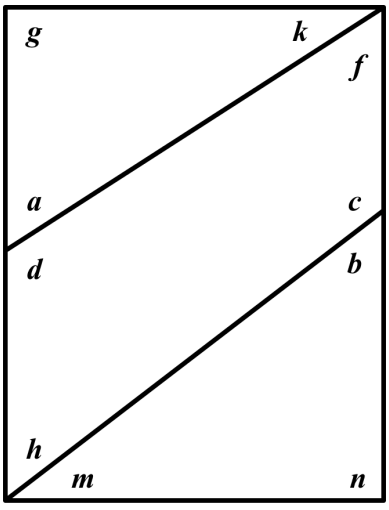
1.1



1.2



Here is a rectangle.



2.1 List a pair of angles that are **complementary.**

2.2 Label a pair of angles that are **supplementary.**

2.3 If angle h is $59°$, determine the value of one other angle. Label it on the diagram.

2.4 If angle a is $59°$, determine the value of one other angle. Label it on the diagram.

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Unit 7.7, Lesson 2: Practice Problems

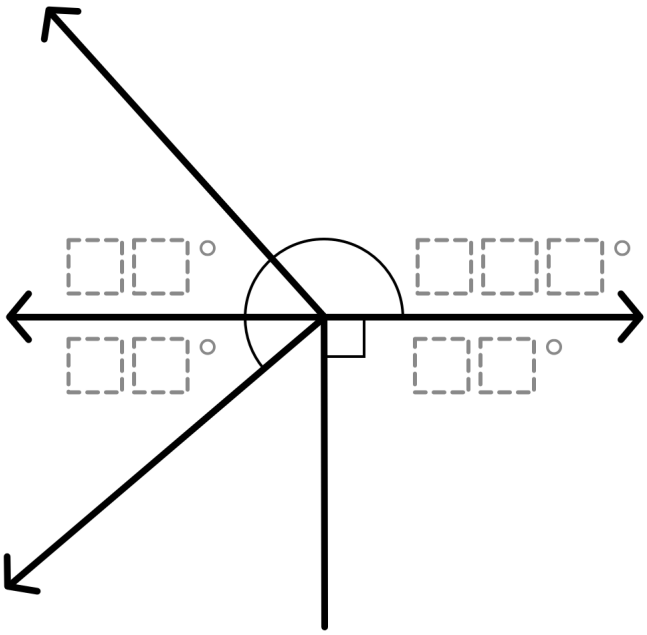
A small dog gets fed $\frac{3}{4}$ of a cup of dog food twice a day.

3.1 Using d for the number of days and f for the amount of food (in cups), write an equation relating the variables.

3.2 Use the equation to find how many days a large bag of dog food will last if it contains 210 cups of food.

Explore

Use the digits 0 to 9, without repeating, to fill each blank. One digit will not be used.



Reflect

1. Mark the question you are most proud of answering.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.7, Lesson 2: Practice Problems

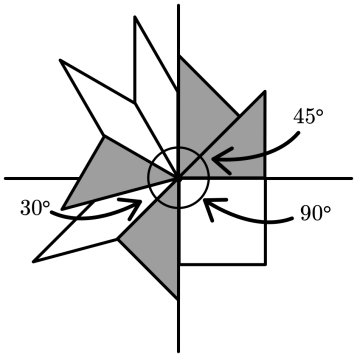
Answer Key

Warm-Up

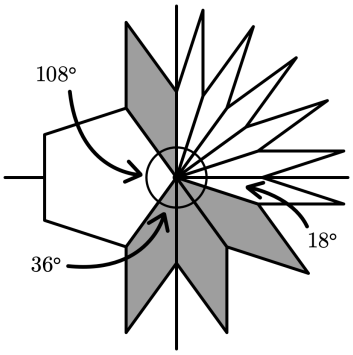
$x = 140$	$x = 50$	$x = 70$	$x = 50$

Practice

1.1



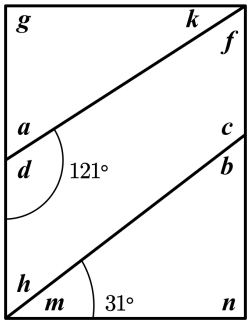
1.2



2.1 *Responses vary.*

- h and m
- k and f

2.2 *Responses vary.*



- a and d
- b and c
- g and n

2.3 *Responses vary.* $m = 31°$

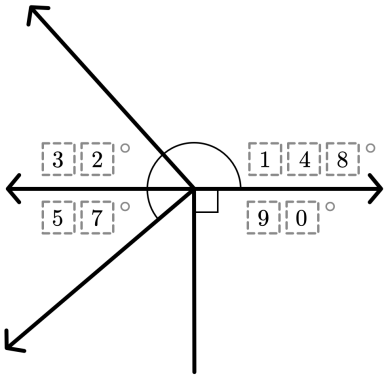
2.4 *Responses vary.* $d = 121°$

3.1 $f = 1.5d$

3.2 140 days

Explore

Responses vary.



desmos

Unit 7.7, Lesson 3: Practice Problems Name _____

Warm-Up

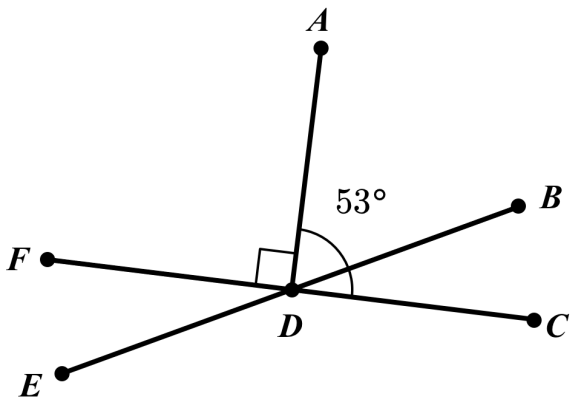
Select **all** of the equations that are equivalent to $3x + 45 = 180$.

☐ $3(x + 45) = 180$ ☐ $3(x + 15) = 180$ ☐ $3(x + 15) = 60$ ☐ $x + 15 = 60$ ☐ $3x = 135$

Practice

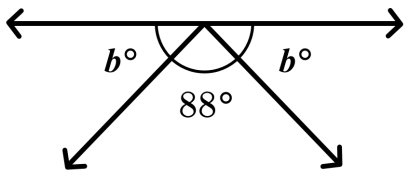
1.1 Determine the measure of each angle.

Angle	Measure (degrees)
ADB	53
BDC	
CDE	
FDE	
FDA	



1.2 Identify one pair of vertical angles in the diagram. Explain how you know they are vertical angles.

2.1 Which equation represents the relationship between the angles in the figure?



A. $88 + b = 90$

B. $88 + b = 180$

C. $2b + 88 = 90$

D. $2b + 88 = 18$

2.2 Dakota says that the angles marked b are vertical angles. Eva disagrees.

Who do you agree with?

Explain your reasoning.

desmos

Unit 7.7, Lesson 3: Practice Problems

Eva is solving the equation $4(x + \frac{3}{2}) = 8$. She says, "I can subtract $\frac{3}{2}$ from each side to get $4x = \frac{13}{2}$ and then divide by 4 to get $x = \frac{13}{8}$." Dakota says, "I think you made a mistake."

3.1 How can Dakota know for sure that Eva's solution is incorrect?

3.2 Describe the error that Eva might have made.

3.3 Determine the correct value for x.

Explore

Draw a diagram that includes supplementary, complementary, and vertical angles.
Measure as many angles as you can, but only label some of them.
Then, trade with a classmate and solve for the missing angles in their puzzle.

Reflect

1. Star the question you are most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.7, Lesson 3: Practice Problems

Answer Key

Warm-Up

✓ $3(x + 15) = 180$ ✓ $x + 15 = 60$ ✓ $3x = 135$

Practice

1.1

Angle	Measure (degrees)
ADB	53
BDC	37
CDE	143
FDE	37
FDA	90

1.2 *Responses vary.* Angles BDC and FDE.

Explanations vary. These are vertical angles because they are angles opposite each other where two lines cross.

2.1 D. $2b + 88 = 180$

2.2 Eva

Explanations vary. The angles are equal, but not vertical angles. The angles are made from one line and two segments meeting at one point. To be vertical angles, they would need to be made from two lines crossing.

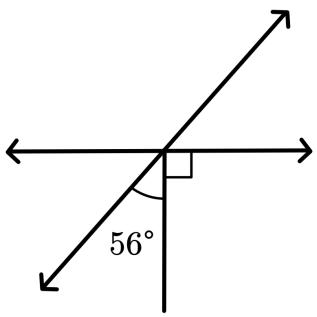
3.1 Dakota could substitute $\frac{13}{8}$ for x in the equation and check if the expression on the left-hand side is equal to 8.

3.2 *Responses vary.* Eva may not have realized that the 4 was multiplied by both x and $\frac{3}{2}$.

3.3 $x = \frac{1}{2}$

Explore

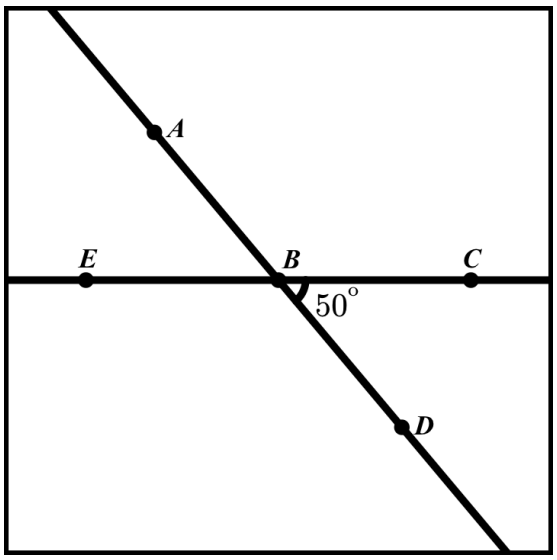
Responses vary.



desmos

Unit 8.1, Lesson 10: Practice Problems Name _____

1. Find the measure of each angle in the diagram.

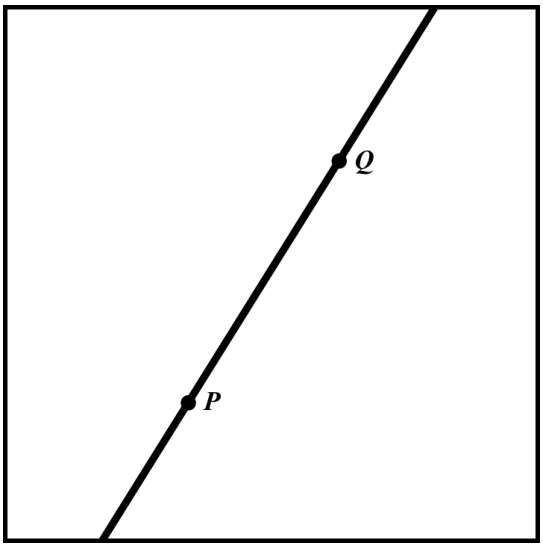


Enter your answers in the table.

Angle	Measure (degrees)
DBC	
ABC	
EBD	
ABE	

Explain your thinking.

2. Points P and Q are plotted on a line.



- Plot point R so that a $180°$ rotation with center R sends P to Q and Q to P.
- Is there more than one point R that works?

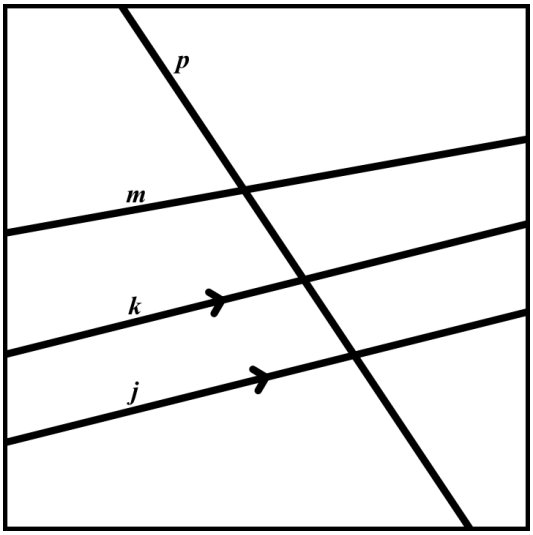
  Explain your thinking.

desmos

Unit 8.1, Lesson 10: Practice Problems

3.1 Which of the lines in the picture is parallel to line j?

Explain your thinking.

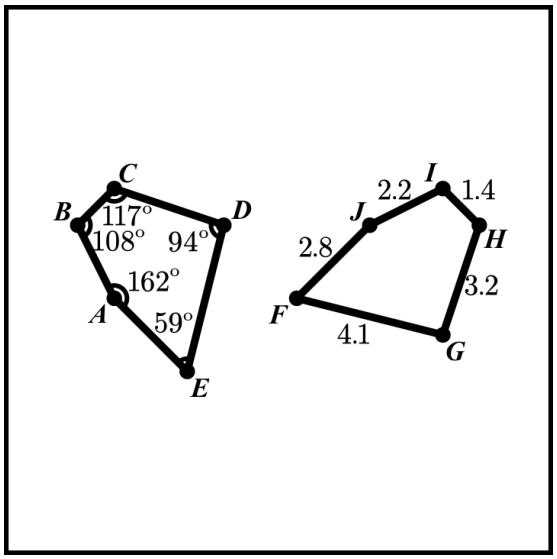


3.2 Explain how to translate, rotate, or reflect line j to obtain line k.

3.3 Explain how to translate, rotate, or reflect line j to obtain line p.

4.1 Are these two pentagons congruent?

Explain your thinking.



4.2 Find the side lengths of $ABCDE$ and the angle measures of $FGHIJ$.

Enter your answers in the table.

Side	Length	Angle	Measure
AB		F	
BC		G	
CD		H	
DE		I	
EA		J	

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Unit 8.1, Lesson 10: Practice Problems

Answer Key

1.

- $130°$. Angle ABC and angle CBD make a line, so they add up to $180°$.
- $130°$. Angle EBD and angle CBD make a line, so they add up to $180°$.
- $50°$. Angle ABE and angle ABC make a line, so they add up to $180°$.

2.

- If R is the midpoint of segment PQ, then a rotation of $180°$ with center R sends P to Q and Q to P.
- No. The midpoint of PQ is the only point that works. $180°$ rotations with any other center do not send P to Q and Q to P.

3.1 k. These two lines do not intersect no matter how far out they extend.

3.2 Line k can be obtained by translating line j.

3.3 Line p can be obtained by rotating line j.

4.1 Yes.

Explanations vary. After performing a $90°$ clockwise rotation with center D, then translating 3 units down and 6 units to the right, $ABCDE$ matches up perfectly with $JIHGF$. The rotation and translation do not change side lengths or angle measures.

4.2

Side	Length	Angle	Measure
AB	2.2	F	$59°$
BC	1.4	G	$94°$
CD	3.2	H	$117°$
DE	4.1	I	$108°$
EA	2.8	J	$162°$

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Unit 8.1, Lesson 11: Practice Problems Name _____

1. If ABC is an **isosceles** triangle and the measure of angle $A = 40°$, what are possible measures for angles B and C?

Angle	Measure (degrees)
A	40
B	
C	

If ABC is a **right** triangle and the measure of angle $A = 40°$, what are possible measures for angles B and C?

Angle	Measure (degrees)
A	40
B	
C	

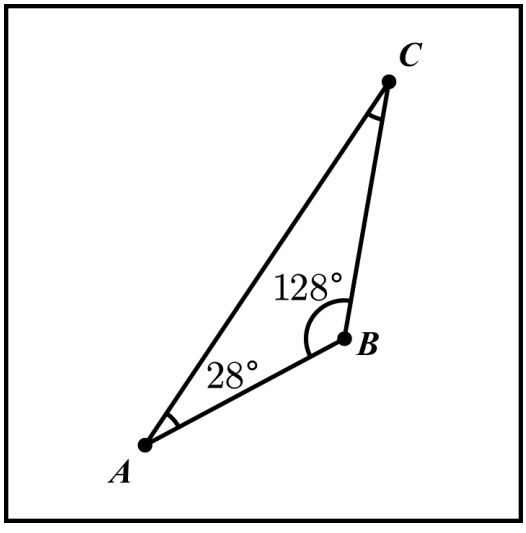
2. Select all of the following sets of angles that are possible for a triangle.

- ☐ $60°, 60°, 60°$
- ☐ $90°, 90°, 45°$
- ☐ $30°, 40°, 50°$
- ☐ $90°, 45°, 45°$
- ☐ $120°, 30°, 30°$

3. Angle A in triangle ABC is obtuse. Can angle B or angle C be obtuse?

   Explain your thinking.

4.1 Determine the measure of the missing angle.



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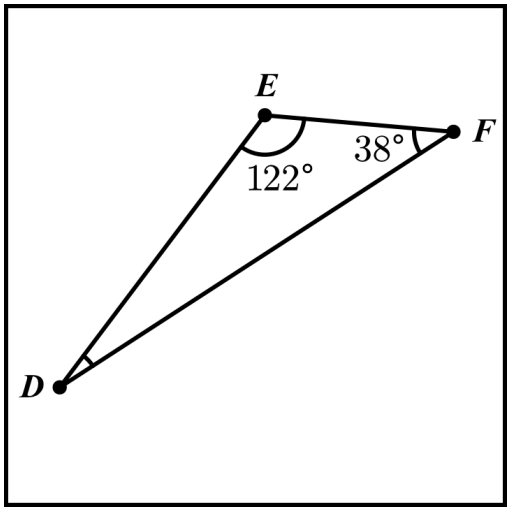
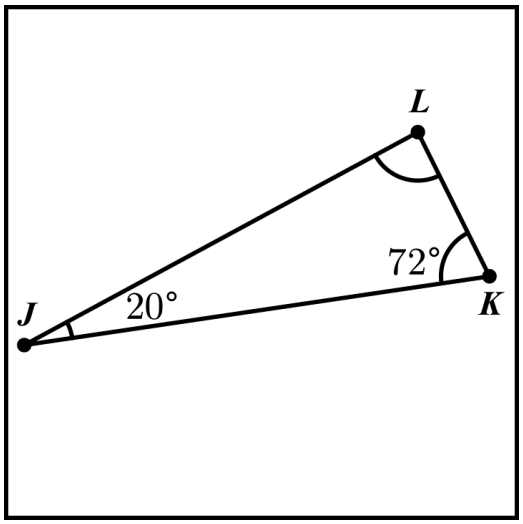
Unit 8.1, Lesson 11: Practice Problems

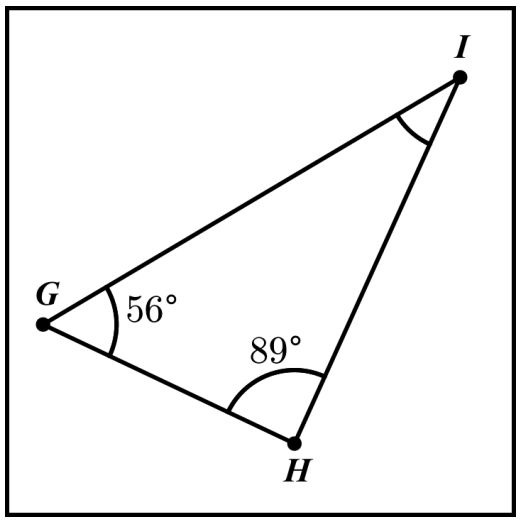
4.2 Determine the measure of the missing angle.



4.3 Determine the measure of the missing angle.



4.4 Determine the measure of the missing angle.



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Unit 8.1, Lesson 11: Practice Problems

Answer Key

1. *Responses vary.*

Isosceles Triangle

Angle	Measure (degrees)
A	$40, 40, 40$
B	$70, 40, 100$
C	$70, 100, 40$

Right Triangle

Angle	Measure (degrees)
A	40
B	50
C	90

2.

- ✓ $60°, 60°, 60°$
- ✓ $90°, 45°, 45°$
- ✓ $120°, 30°, 30°$

3. No, a triangle cannot have two obtuse angles.

   Explanations vary. The angles in a triangle need to add to 180 degrees. If two of the angles are obtuse, then that is already more than $90 + 90 = 180$ degrees.

4.1 $24°$ $(24 + 28 + 128 = 180)$

4.2 $20°$ $(20 + 38 + 122 = 180)$

4.3 $88°$ $(88 + 20 + 72 = 180)$

4.4 $35°$ $(35 + 89 + 56 = 180)$

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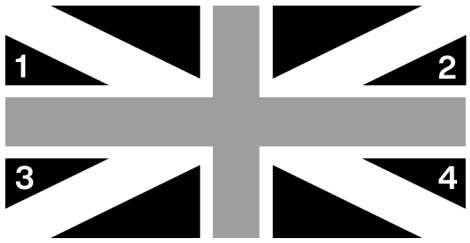
Unit 8.1, Lesson 12: Practice Problems Name _____

1. Is there such thing as a triangle with two right angles?

   Explain your thinking.

2.1 Here is a picture of an older version of the flag of Great Britain.



There is a rigid transformation that takes Triangle 1 to Triangle 2, another that takes Triangle 1 to Triangle 3, and another that takes Triangle 1 to Triangle 4.

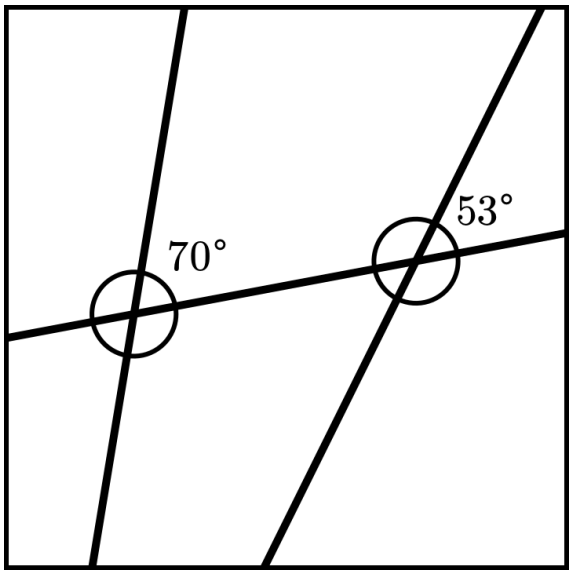
Measure the side lengths of Triangles 1 and 2. What do you notice?

2.2 How could you determine the side lengths of Triangle 3 without measuring it?

2.3 Do all eight triangles in the flag have the same area? Explain your thinking.

3. The diagram shows three lines with some missing angle measures.

   Fill in the missing angle measures.



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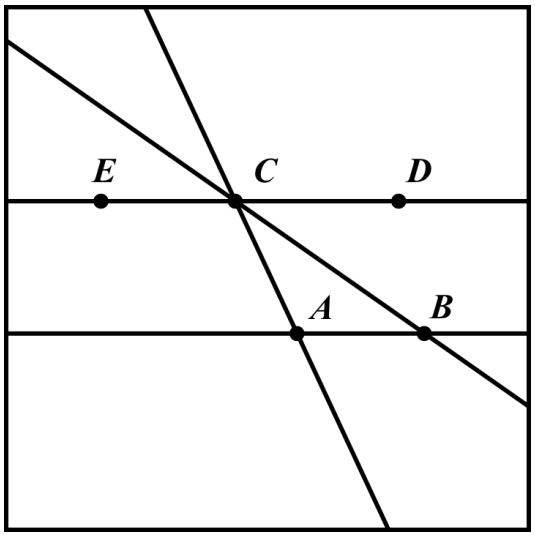
Unit 8.1, Lesson 12: Practice Problems

4. In this diagram, lines AB and CD are parallel.

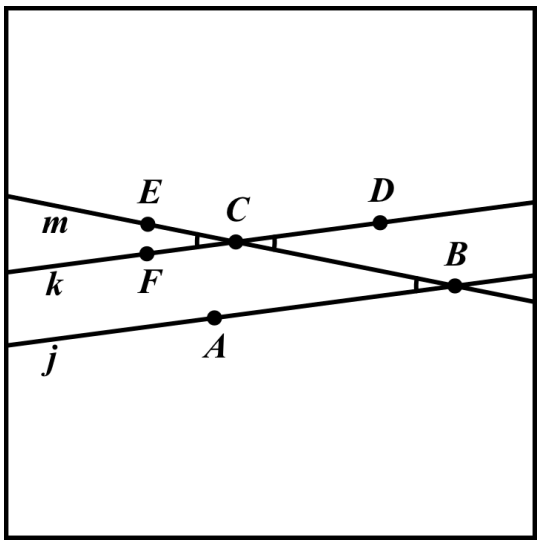


Angle ABC measures $35°$.
Angle BAC measures $115°$.

Complete the table.

Angle	Measure (degrees)
ACE	
DCB	
ACB	

5.1 Lines k and j are parallel and the measure of angle ABC is $19°$.



Explain why the measure of angle ECF is $19°$.

5.2 The measure of angle ECF is $19°$.

What is the measure of angle BCD?

Explain your thinking.

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Unit 8.1, Lesson 12: Practice Problems

Answer Key

1. No.

   Explanations vary. The three angles in a triangle add up to $180°$. Two right angles would make $180°$, so the third angle of the triangle would have to be 0 degrees, which is not possible.

2.1 (From Unit 1, Lesson 8)

Responses vary. The side lengths of the two triangles are the same.

2.2 (From Unit 1, Lesson 8)

The side lengths would be the same as Triangle 1 because there is a rigid transformation taking Triangle 1 to Triangle 3.

2.3 (From Unit 1, Lesson 8)

No.

Explanations vary. The four triangles without number labels are larger, so they will not have the same area as the smaller labeled triangles.

3. (From Unit 1, Lesson 10)

Angles on the left going clockwise from bottom right:

- $110°$
- $70°$
- $110°$

Angles on the right going clockwise from bottom right:

- $127°$
- $53°$
- $127°$

4.

Angle	Measure (degrees)
ACE	$115°$
DCB	$35°$
ACB	$30°$

5.1 (From Unit 1, Lesson 10)

Explanations vary. If j is translated so that B goes to C, then j goes to k because k is parallel to j. Angle ABC matches up with angle FCE after this translation, so FCE (or ECF) is also a $19°$ angle.

5.2 (From Unit 1, Lesson 10)

$19°$

Explanations vary. Angles EFC and BCD are congruent because they are vertical angles. Since angle EFC is a $19°$ angle, so is angle BCD.

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Unit 7.7, Lesson 5: Practice Problems Name _____

Warm-Up

Determine the value of each expression.

$5 - 8 =$ $5 + (-8) =$ $(-5) + 8 =$ $(-5) + (-8) =$

Practice

1.1 Select **all** the sets of side lengths that will make a triangle.

- ☐ 3 units, 4 units, 8 units
- ☐ 7 units, 6 units, 12 units
- ☐ 5 units, 13 units, 11 units
- ☐ 12 units, 6 units, 4 units
- ☐ 4 units, 6 units, 10 units

1.2 For one of the sets of side lengths you did not select, explain how you know they **will not** make a triangle.

2. One side of a triangle is 5.5 inches long. Another is 10.5 inches long. Which of the following could be the length of the third side?

☐ 3 inches ☐ 5 inches ☐ 7 inches ☐ 10 inches ☐ 12 inches ☐ 20 inches

A triangle has one side that is 4 centimeters long and one that is 9 centimeters long. The third side is a whole number of centimeters.

3.1 What is the shortest possible third side?

3.2 What is the longest possible third side?

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Unit 7.7, Lesson 5: Practice Problems

Solve each equation.

4.1 $1.5 = 0.6(w + 0.3)$

4.2 $1.5 = 0.6w + 0.3$

5. Arjun says that since $\frac{1}{12}$ and $\frac{2}{12}$ produce repeating decimal values, any fraction with a denominator of 12 will also produce a repeating decimal.

   Is Arjun correct? Show or explain your thinking.

Explore

Create a set of four lengths so that:

- Each length is different.
- Each length is a whole number (in inches).
- No matter which three you choose, you will **always** be able to make a triangle.

Explain how you know that your set of lengths meet all the requirements.

Reflect

1. Star the question that you are most proud of.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.7, Lesson 5: Practice Problems

Answer Key

Warm-Up

$-3, -3, 3, -13$

Practice

1.1 ✓ 7 units, 6 units, 12 units
✓ 5 units, 13 units, 11 units

1.2 *Responses vary.* 4 units, 6 units, and 12 units will not make a triangle because the sum of the two shortest sides is not greater than the length of the longest side.

2. ✓ 7 inches
✓ 10 inches
✓ 12 inches

3.1 6 centimeters

3.2 12 centimeters

4.1 $w = 2.2$

4.2 $w = 2$

5. Disagree.
Explanations vary.
- I know that $\frac{12}{12}$ will be equal to 1, which is not a repeating decimal.
- Some fractions with 12 as the denominator produce repeating decimals, but others like $\frac{3}{12}$ and $\frac{6}{12}$ do not.

Explore

Responses vary.

3 inches, 4 inches, 5 inches, and 6 inches

No matter which three lengths are used, the sum of the two shortest sides will always be greater than than the length of the longest side. This is true as long as the sum of the shortest two of the four side lengths are greater than the longest side length.

desmos

Unit 7.7, Lesson 6: Practice Problems Name _____

Warm-Up

Calculate each difference.

$4 - 9 =$ $(-4) - 9 =$ $4 - (-9) =$ $(-4) - (-9) =$

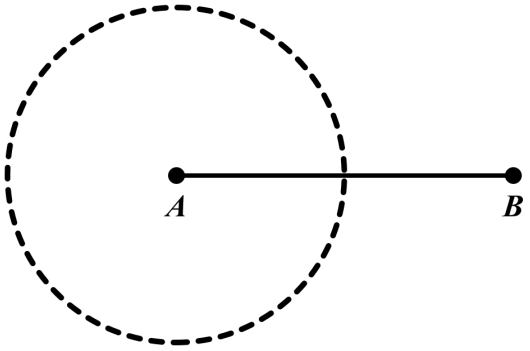
Practice

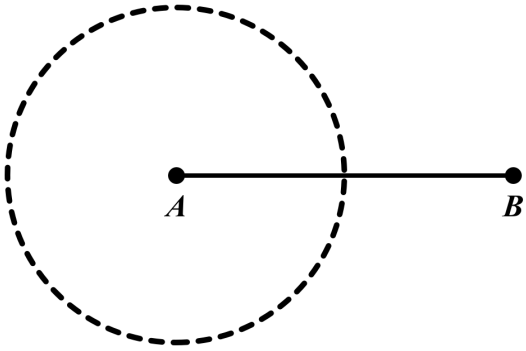
A triangle has one side that is 6 units long and another side that is 3 units long.

1.1 Which of the following could be the length of the third side?

☐ 2 units ☐ 3 units ☐ 4 units ☐ 6 units ☐ 8 units ☐ 10 units

1.2 In the diagrams, segment AB is 6 units and the radius of circle A is 3 units. Draw two different triangles where one side is 6 units long and another side is 3 units long.



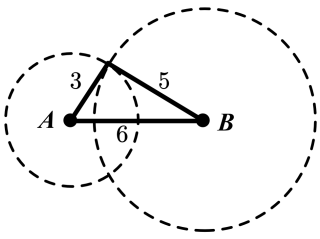


2. Faith drew two triangles with side lengths of 3 units, 5 units, and 6 units.

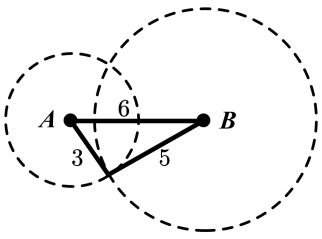
Are the triangles identical?

Explain your reasoning.

Triangle 1



Triangle 2



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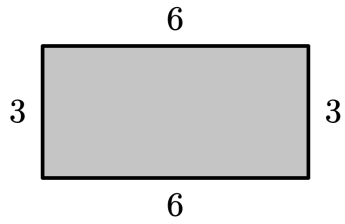
Unit 7.7, Lesson 6: Practice Problems

3. Antwon drew this rectangle. Convince him that this is not the only quadrilateral you can draw with these side lengths. Explain or show your reasoning.



4.1 If you deposit $\$300$ in an account and it grows by 6% each year, how much money will be in your account after 1 year?

4.2 If you leave this money in the account, how much will be in your account after 2 years?

Explore

Create a list of five lengths so that:

- Each length is different.
- Each length is a whole number (in inches).
- The longest length is shorter than a piece of paper (11 inches).
- No matter which three you choose, you will **never** be able to make a triangle.

Explain how you know that your set of lengths meet all the requirements.

Reflect

1. Circle one question you are still wondering about.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.7, Lesson 6: Practice Problems

Answer Key

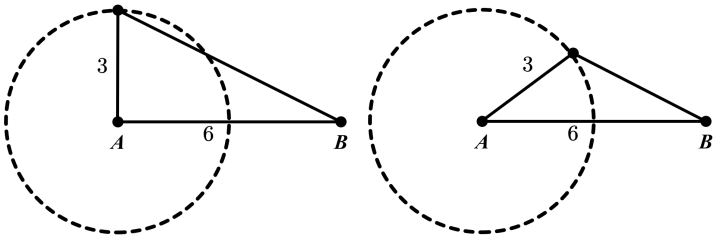
Warm-Up

$-5, -13, 13, 5$

Practice

1.1 ✓ 4 units
✓ 6 units
✓ 8 units

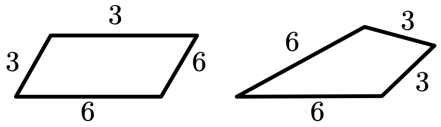
1.2 *Responses vary.*



2. Yes.

   Explanations vary. The triangles are identical copies because if you were to move or turn one triangle on top of the other, they would be the same size and shape.

3. *Responses vary.*



   It is possible to draw a parallelogram or a kite using these side lengths.

4.1 $318

4.2 $337.08

Explore

Responses vary.

1 inch, 2 inches, 3 inches, 6 inches, and 10 inches

No matter which three lengths are used, the sum of the two shortest sides will always be shorter than or equal to the length of the longest side. 10 inches is too long for 3 inches and 6 inches, 6 inches is too long for 2 inches and 3 inches, and 3 inches is too long for 1 inch and 2 inches.

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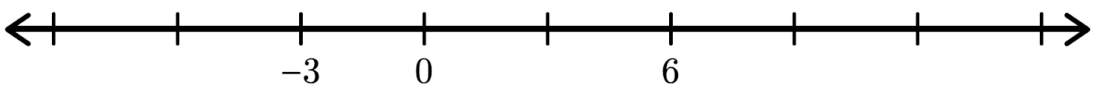
Unit 7.7, Lesson 7: Practice Problems Name _____

Warm-Up

Complete the number line. The markings on the number line are equally spaced.

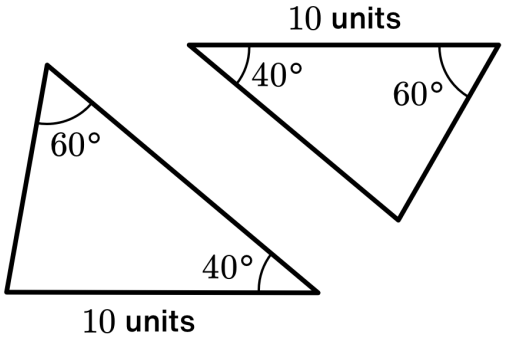


Put a star over the point on the number line that represents the value of $(-3)(-2)$.

Practice

1. Are these two triangles identical?

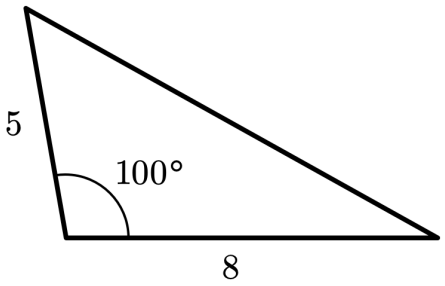
   Explain your thinking.



2. This triangle has a side length of 5 units, a side length of 8 units, and a 100° angle.

   Is this the only triangle that can be created with these three measurements?

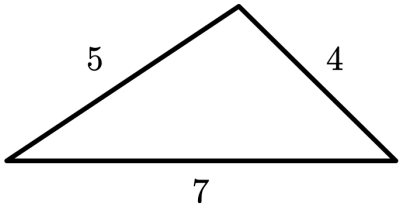
   Explain or show your reasoning.



3. This triangle has side lengths of 7 cm, 4 cm, and 5 cm.

   Is this the only triangle that can be created with these three measurements?

   Explain or show your reasoning.



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Unit 7.7, Lesson 7: Practice Problems

Two months ago, the price of a cell phone was c dollars.

4.1 Last month, the price of the phone increased by 10%. Write an expression for the price of the phone last month.

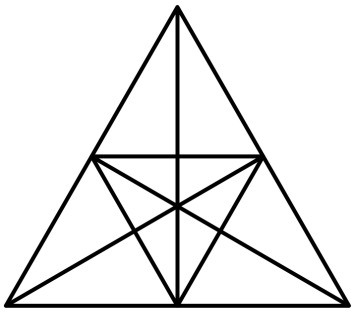
4.2 This month, the price of the phone decreased by 10%. Is the price of the phone this month the same as it was two months ago? Explain your reasoning.

5. Each row contains the degree measures of two angles. Complete the table.

Angle Measure	Measure of the Supplementary Angle
$80°$	
$25°$	
$119°$	
x	

Explore

How many **different** triangles are there in this image? Explain or show your reasoning.



Reflect

1. Put a smiley face next to the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

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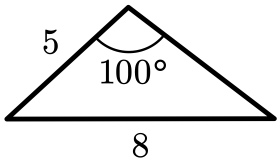
Unit 7.7, Lesson 7: Practice Problems **Answer Key**

Warm-Up

Practice

1. No.
   Explanations vary. The 10 units in the first triangle is adjacent to the $40°$ and between the two angles in the second triangle. The triangle on the left is also larger.

2. No.
   Explanations vary. It is possible to create other triangles using these measurements if you change where the angle is related to the sides.



3. Yes.
   Explanations vary. Any other triangles with the same three side lengths will be identical, even if they are turned around.

4.1 $1.1c$

4.2 No.
Explanations vary. Increasing by 10% is 110% of the original price. Decreasing by 10% will be 99% of the original (because $1.1 \times 0.9 = 0.99$).

5.

Angle Measure	Measure of the Supplementary Angle
$80°$	$100°$
$25°$	$155°$
$119°$	$61°$
x	$180° - x°$

Explore

8 different triangles (47 triangles total)

Explanations vary.

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Unit 7.7, Lesson 8: Practice Problems Name _____

Warm-Up

Calculate each value.

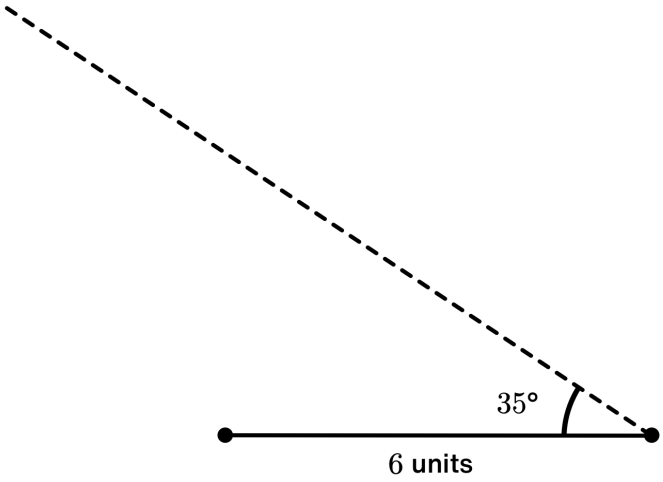
$\frac{24}{-4}=$ $\frac{-24}{-4}=$ $\frac{-24}{4}=$ $\frac{-24-4}{-4}=$

Practice

1. A triangle has a 90° angle, a 35° angle, and a side that is 6 units long.

   The 6-unit side is in between the 90° and 35° angles.

   Complete the diagram and label your diagram with the given measures.



2. For each set of three measurements, decide whether you can create zero triangles, one triangle, or two or more triangles. Use the space provided to show or explain your thinking.

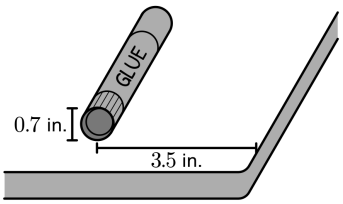
Measurements	Number of Unique Triangles (Circle One)	Your Thinking
• A side 4 cm long • A side 6 cm long • A $50°$ angle	$0 \quad 1 \quad 2+$	
• A side 4 cm long • A side 5 cm long • A side 6 cm long	$0 \quad 1 \quad 2+$	
• A $90°$ angle • A $100°$ angle • A $30°$ angle	$0 \quad 1 \quad 2+$	

desmos

Unit 7.7, Lesson 8: Practice Problems

3. Diego has a glue stick with a diameter of 0.7 inches. He sets it down on its side 3.5 inches away from the edge of his desk, but it starts to roll toward the edge of his desk. If the glue stick rolls around twice, will it roll off the edge of the desk?

   Show or explain your reasoning.



Determine if each fraction will have a terminating or repeating decimal representation.

4.1 $\frac{1}{8}$

(Circle one)
Terminating Repeating

4.2 $\frac{1}{11}$

(Circle one)
Terminating Repeating

4.3 $\frac{1}{12}$

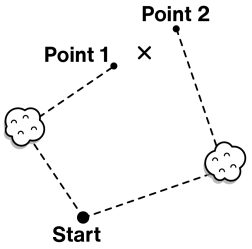
(Circle one)
Terminating Repeating

Explore

Here is a system that some communities use to hide goods using two trees.

Here is how it works:

1. Walk to one tree, noting how far you walked.
2. Turn right $90°$. Walk the same distance and mark the ground.
3. Go back to the start. Walk to the other tree, noting how far you walked.
4. Turn left $90°$. Walk that distance again and make a second mark.
5. Dig halfway between the two marks on the ground.



Try this strategy in your home using chairs or other objects, or try it outside using trees.

Convince yourself that the burial spot will be in the **same location** no matter where you start.

Reflect

1. Circle the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.7, Lesson 8: Practice Problems

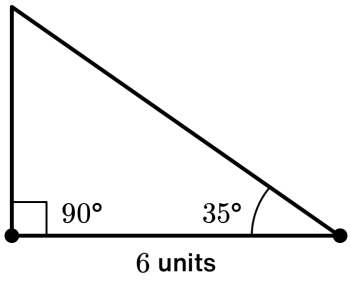
Answer Key

Warm-Up

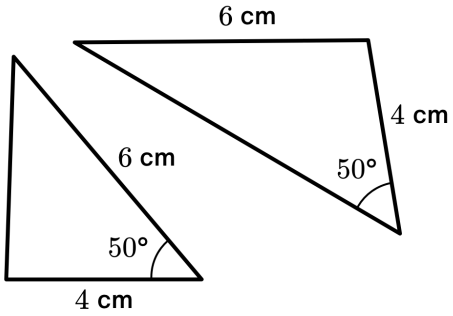
−6, 6, −6, 7

Practice

1.

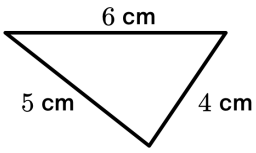


2.1 2 + triangles



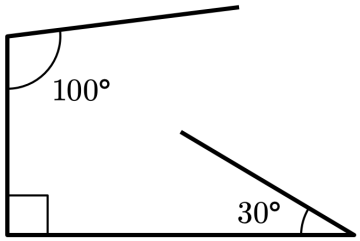
Explanations vary. You change the position of the angle to create more than one triangle.

2.2 1 triangle



Explanations vary. Any two triangles with all the same side lengths will be identical.

2.3 0 triangles



3. 30%

4.1 Terminating

4.2 Repeating

4.3 Repeating

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Unit 7.1, Lesson 2: Practice Problems Name _____

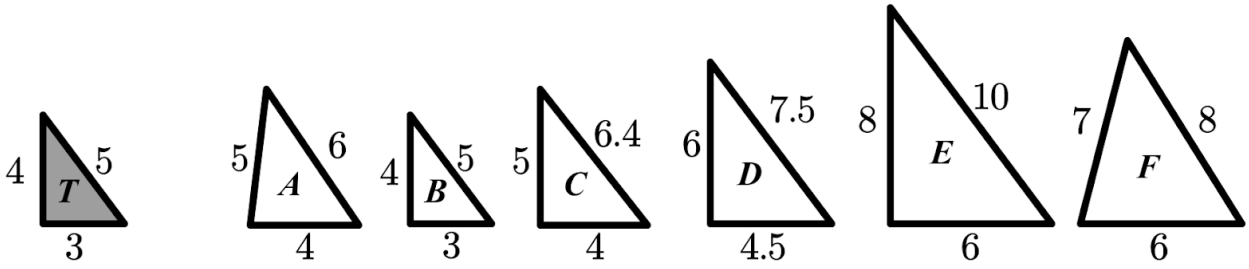
Warm-Up

Complete each equation with a number that makes the equation true.

$8 \cdot \_\_\_\_\_ = 40$ $40 \cdot \_\_\_\_\_ = 8$ $21 \div \_\_\_\_\_ = 7$ $21 \cdot \_\_\_\_\_ = 7$

Practice

1.1 Select three triangles that are scaled copies of triangle T.

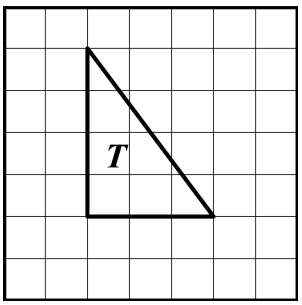


1.2 For each, write the scale factor from triangle T to that triangle.

Triangle _____ Triangle _____ Triangle _____

Scale factor: _____ Scale factor: _____ Scale factor: _____

1.3 Use what you know about area to determine the area of triangle T.



2. Sketch a triangle and label its side lengths. Then draw a scaled copy and label its lengths.

Original Triangle Scaled Copy

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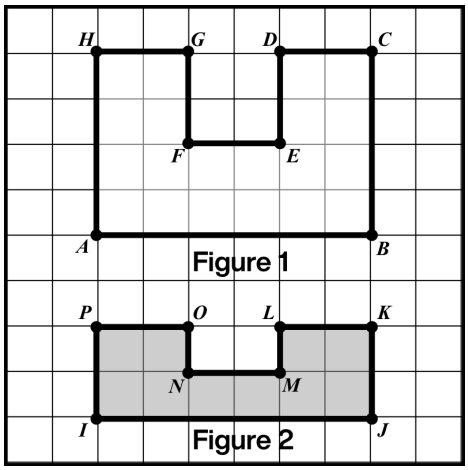
Unit 7.1, Lesson 2: Practice Problems

3. Brianna says that Figure 2 is a scaled copy of Figure 1.

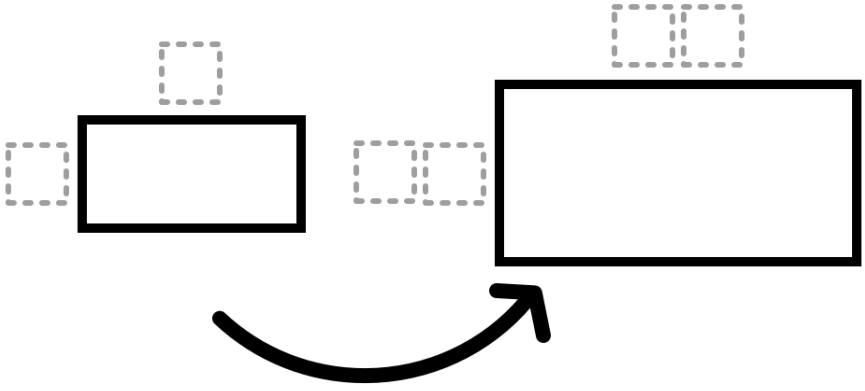
   Do you agree with Brianna? _____

   Explain your reasoning.



Explore

Using the digits 0 to 9 without repetition, fill in the blanks to make a scaled copy.
Use the space below to record any of your thinking as you experiment.



Reflect

1. Put a heart next to the question you are most proud of on this practice worksheet.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.1, Lesson 2: Practice Problems

Answer Key

Warm-Up

$8 \cdot (2 + 3) = 40$

$40 \cdot \frac{1}{5} = 8$

$21 \div 3 = 7$

$21 \cdot \frac{1}{3} = 7$

Practice

1.1–1.2 These triangles are scaled copies of triangle T:

- B (Scale factor: 1)
- D (Scale factor: 1.5)
- E (Scale factor: 2)

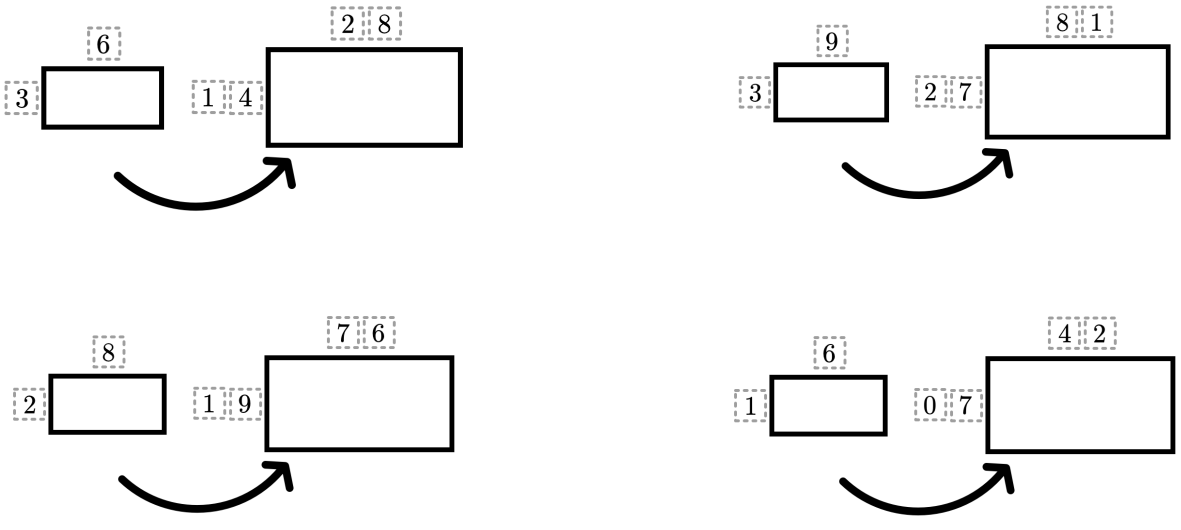
1.3 6 square units

2. *Responses vary.* The scaled copy must have a consistent scale factor that is multiplied to all lengths.

3. No. Figure 2 is not a scaled copy of Figure 1. *Explanations vary.*
   - Even though the height of Figure 2 is half the height of Figure 1, their widths are the same. Therefore, there is not the same scale factor between each pair of distances.
   - Not every side length is multiplied by the same scale factor. $4 \cdot \frac{1}{2} = 2$, but $6 \cdot 1 = 6$.

Explore*

Responses vary. Here are a few possible responses.



*See similar problems at openmiddle.com.

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Unit 7.1, Lesson 3: Practice Problems Name _____

Warm-Up

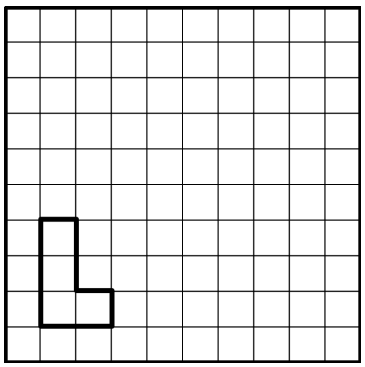
Determine the value of x that makes each equation true.

$2 + x = 1$ $2 \cdot x = 1$ $\frac{1}{7} \cdot x = 1$ $x \cdot 11 = 1$

$x =$ $x =$ $x =$ $x =$

Practice

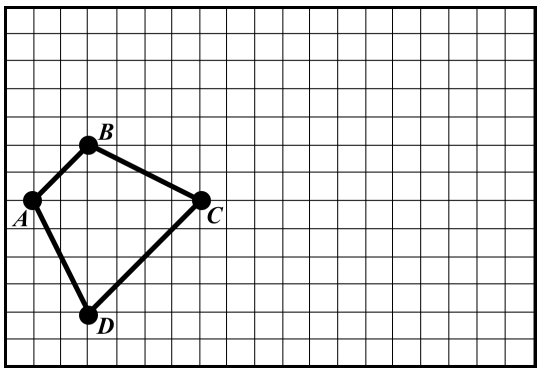
1.1 Draw a scaled copy of the figure on the right using a scale factor of 2.



1.2 What is the area of the scaled copy you drew?

1.3 What is the perimeter of the scaled copy?

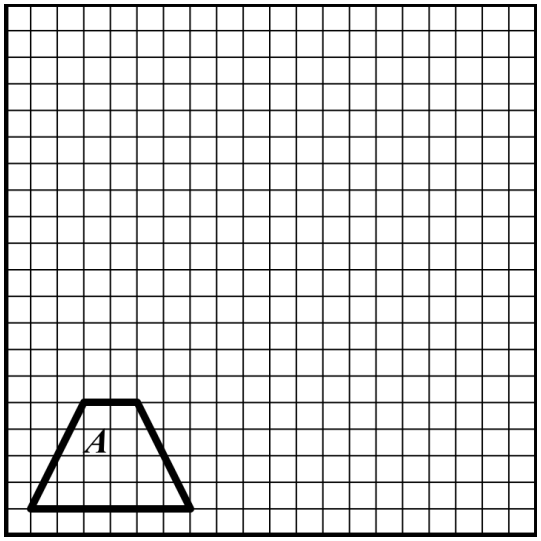
2. Draw a scaled copy of figure $ABCD$ using a scale factor of 1.5.



3.1 Quadrilateral B is a scaled copy of quadrilateral A. Its shortest side is 5 units long.

What is the scale factor from A to B? _____

3.2 Draw quadrilateral B.



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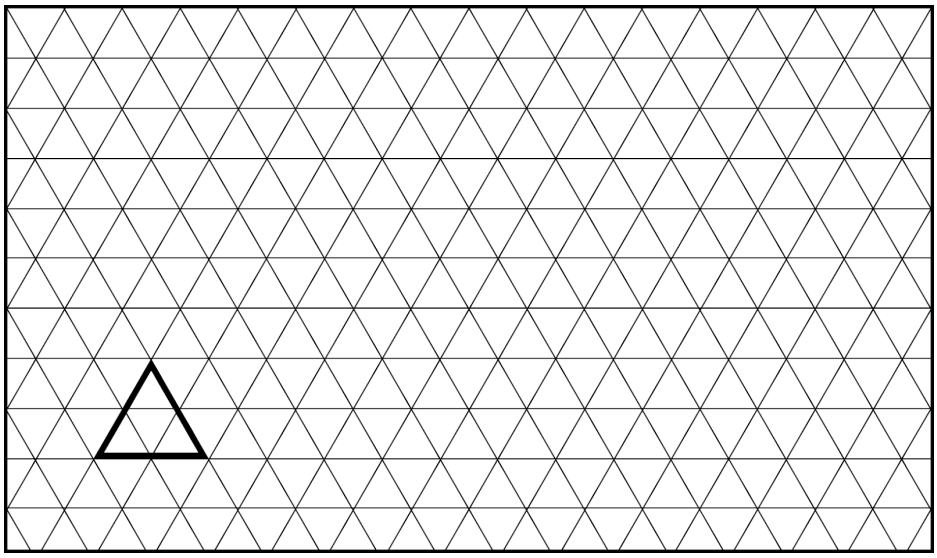
Unit 7.1, Lesson 3: Practice Problems

4. Polygon C has side lengths 2, 3, 4, and 6 units.
   Polygon D has side lengths 4, 5, 6, and 8 units.

   Could these be scaled copies of each other? Explain.

Explore

Draw a scaled copy of this equilateral triangle using a scale factor of 3.



Equilateral triangles are always scaled copies. What other shapes are always scaled copies?

Reflect

1. Put a smiley face next to the question you spent most time on.
2. Use the space below to ask a question you have or share something you are proud of.

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Unit 7.1, Lesson 3: Practice Problems

Answer Key

Warm-Up

$x = -1$

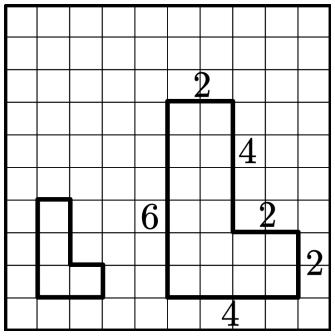
$x = \frac{1}{2}$

$x = 7$

$x = \frac{1}{11}$

Practice

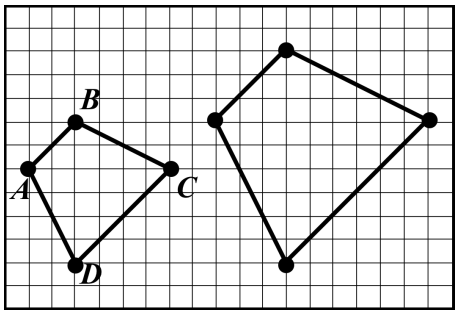
1.1



1.2 **Area of the scaled copy:**
16 square units

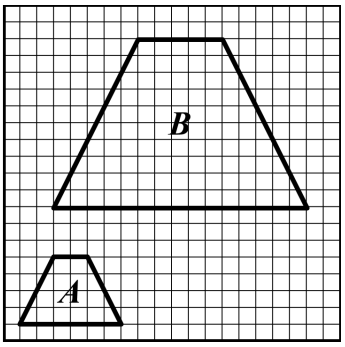
1.3 **Perimeter of the scaled copy:**
20 units

2.



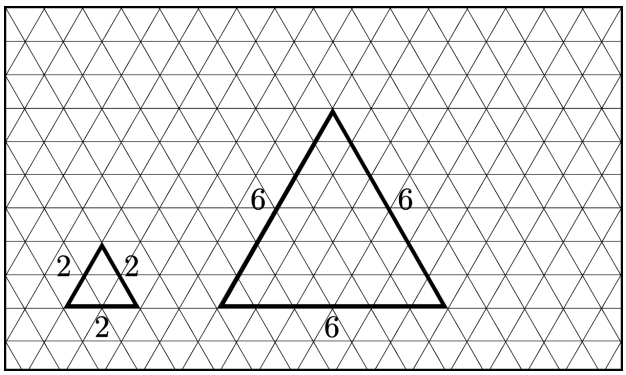
3.1 The scale factor from A to B is 2.5.

3.2



4. No. These cannot be scaled copies of each other. *Explanations vary.*
   - Even though each length in polygon D is 2 units longer than each length in polygon C, adding does not create a scaled copy.
   - Not every side length is multiplied by the same scale factor. $2 \cdot 2 = 4$, but $4 \cdot 1.5 = 6$.

Explore



Other shapes that are always scaled copies: Squares or any regular shape (shapes where all sides and all angles are equal).

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Unit 7.1, Lesson 6: Practice Problems Name _____

Warm-Up

Rectangle A measures 6 cm by 4 cm. Rectangle B is a scaled copy of rectangle A.
Select all of the measurements that could be the dimensions of rectangle B.

☐ 4.5 in. by 3 in. ☐ 5 in. by 3 in. ☐ 10 in. by 8 in. ☐ 1.5 in. by 1 in.

Practice

1. Here is a scale drawing of some of the world's tallest towers.

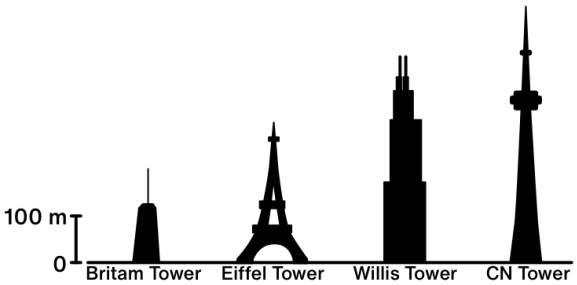
   Use the scale to estimate how tall each tower is.

   Britam Tower: _____

   Eiffel Tower: _____

   Willis Tower: _____

   CN Tower: _____

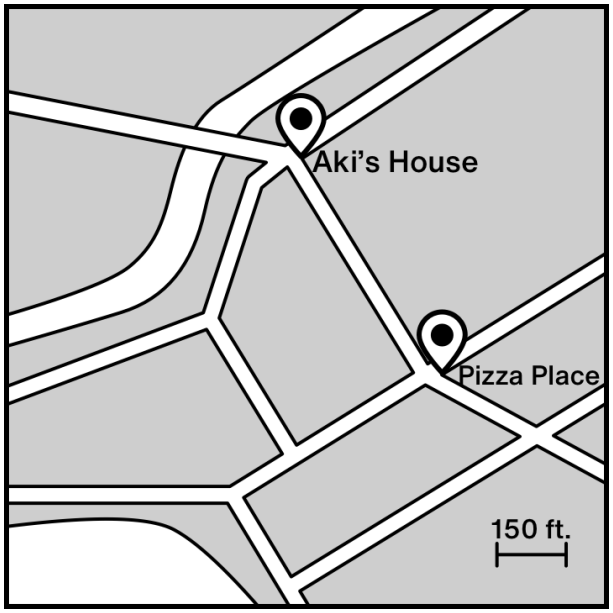


Maps are one common place to find scales. Here is a map of part of a town.

2.1 Approximately how far away is Aki's house from the pizza place? Explain your thinking.

2.2 Add and label a new location on the map.

2.3 Estimate the distance from Aki's house and the pizza place to your location.



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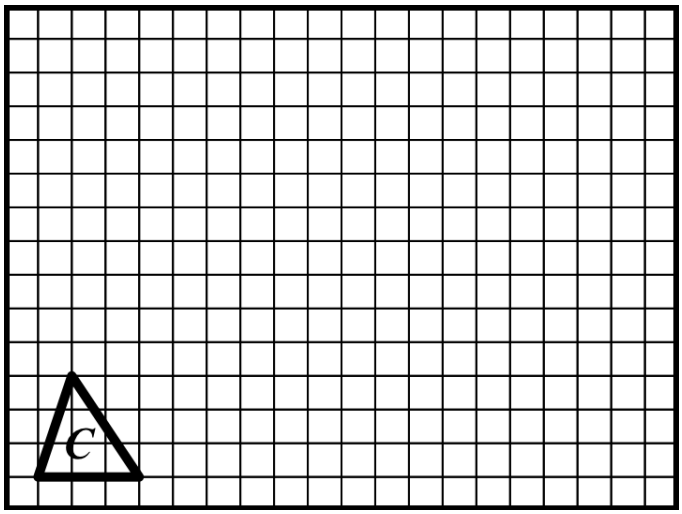
Unit 7.1, Lesson 6: Practice Problems

Here is triangle C. Ivory created a scaled copy of triangle C using a scale factor of 4.



3.1 What is the height of Ivory's copy?

3.2 What is the area of Ivory's copy?

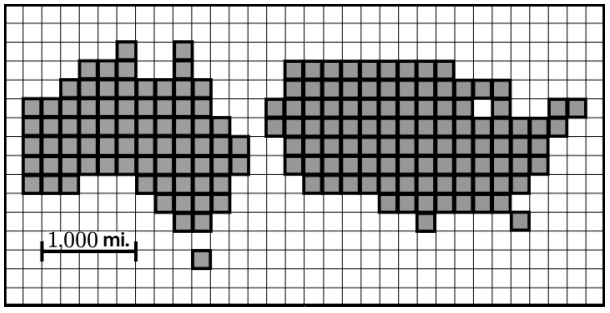
3.3 How many times larger is the area of Ivory's triangle than the area of triangle C?

Explore

A Mercator map is a common map used to show the entire world. Here is a drawing of Australia and the continental U.S. drawn to scale according to this map.

According to the Mercator map, how wide is the USA?

According to the Mercator Map, how wide is Australia?



The continental U.S. is actually **only about 200 miles wider than** Australia. Describe how you would change the map to reflect this fact.

Reflect

1. Put a smiley face next to the question you spent most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.1, Lesson 6: Practice Problems **Answer Key**

Warm-Up

✓ 4.5 in. by 3 in. ☐ 5 in. by 3 in. ☐ 10 in. by 8 in. ✓ 1.5 in. by 1 in.

Practice

1. *Responses vary.*

   Britam Tower: ~ 200 meters

   Eiffel Tower: ~ 300 meters

   Willis Tower: ~ 440 meters

   CN Tower: ~ 550 meters

2.1 *Responses vary.* The distance between Aki's house and the pizza place is about 525 feet because it is about three and a half scale segments long.

2.2 *Responses vary.*

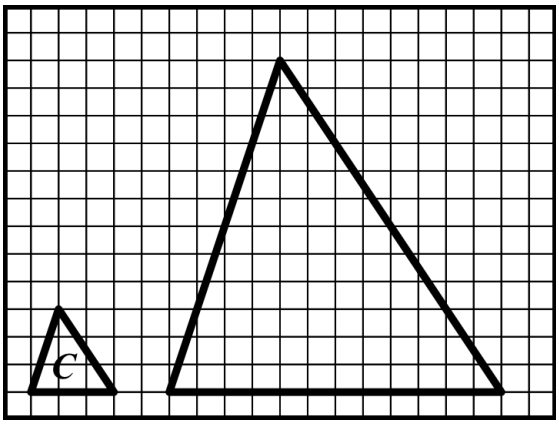
2.3 *Responses vary based on students' choices on Problem 2.2.*

3.1 12 units

3.2 $\frac{1}{2}\ (12)\ (12) = 72$ square units

3.3 16 times larger (because $4.5 \cdot 16 = 72$).

Students may or may not draw the scaled copy.



Explore

USA: About $3\,400$ miles wide
Australia: $2\,400$ miles wide

Responses vary.

- You could scale down the USA so that it is about the same width as Australia.
- You could scale up Australia so that it is about the same width as the USA.

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Unit 7.1, Lesson 7: Practice Problems Name _____

Warm-Up

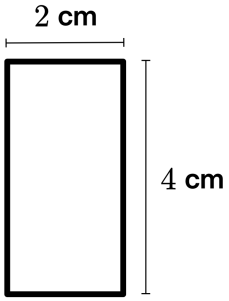
Light bulbs cost $\$12.50$ for 10 bulbs. At this rate, what is the cost of . . .

. . . 20 light bulbs? . . . 50 light bulbs? . . . 1 light bulb?

Practice

The blueprint (a scale drawing used by architects and others) for Zahra's new office measures 4 cm long and 2 cm wide. The scale for the blueprint is 6 cm to 15 ft.

1.1 What is the length and width of her actual office?



1.2 What is the actual area of her office?

1.3 Zahra wants to put a couch in her office that is 3 feet wide. How wide would the couch be if it were drawn on the blueprint?

1.4 Another office in the blueprint is 8 cm long and 4 cm wide. Would it be appropriate to say that this office is twice as large as Zahra's office? Explain your thinking.

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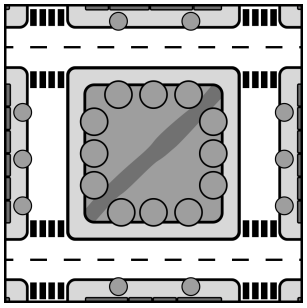
Unit 7.1, Lesson 7: Practice Problems

Zahra is looking at a map of a park that has a scale of 3 in. to 200 ft. On the map, each side of the park is 6 inches long.



2.1 Zahra's distance to the park is 500 feet. How long would this distance be on the map?

2.2 If Zahra runs around the perimeter of the park once, what distance did she run?

2.3 Zahra wants to run a mile (5280 feet). Approximately how many times would she need to run around the park in order to reach her goal?

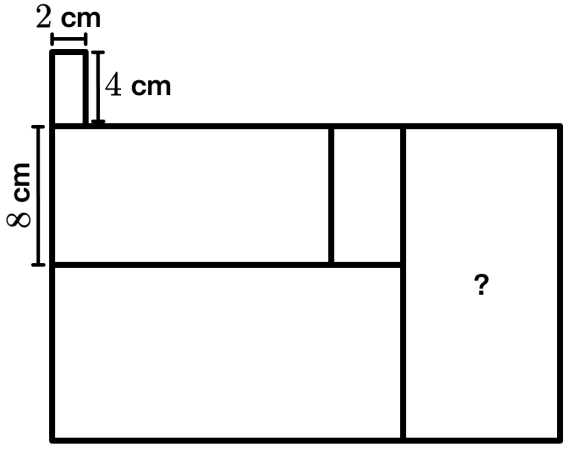
Explore

Here is the whole floor that Zahra's office is on. Each room is a scaled copy of every other room.

The scale for this blueprint is 6 cm to 15 ft.

Use any strategy to determine the **actual area** of the room with the question mark.

Hint: Determine as many lengths as possible.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.1, Lesson 7: Practice Problems

Answer Key

Warm-Up

20 **light bulbs =** $\$25$ 50 **light bulbs =** $\$62.50$ 1 **light bulb =** $\$1.25$

Practice

1.1 10 ft. by 5 ft.

1.2 50 square feet

1.3 1.2 centimeters

1.4 No, it is not appropriate.

Explanations vary.

- The actual dimensions of the other office are 20 ft. by 10 ft., so the area of the larger office is 200 square feet, or 4 times the area of Zahra's office.
- Since each dimension is doubled, the area of the larger office would be more than doubled.

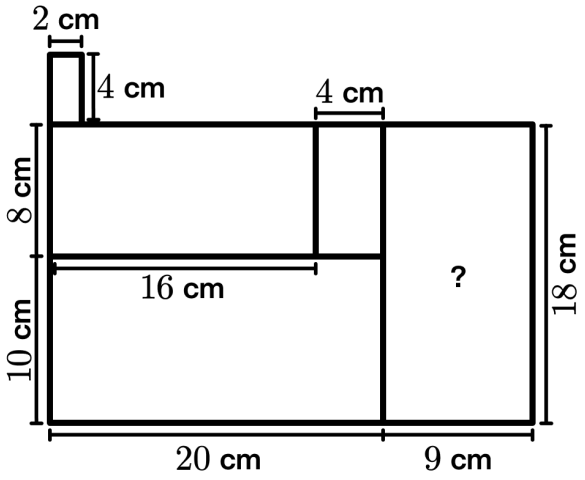
2.1 7.5 inches

2.2 $4 \cdot 400 = 1600$ feet

2.3 ~ 3.3 times around the park. (This number is lower if she begins running from her current location.)

Explore

The dimensions of the room with the question mark are 18 cm by 9 cm, so its actual area is $45 \cdot 22.5 = 1012.5$ square feet.



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Unit 7.1, Lesson 9: Practice Problems Name _____

Warm-Up

Select **all** of the scales that are equivalent to 3 cm to 4 km.

- ☐ 0.75 cm to 1 km
- ☐ 1 cm to $\frac{3}{4}$ km
- ☐ 6 km to 8 cm
- ☐ 7.5 cm to 10 km

Practice

Ali and Kiana buried a treasure together on their school's field.

1.1 Ali made an 8-inch-wide map to record its location. If the actual field is 400 feet wide, write two possible scales Ali could have used to make her drawing.

1.2 Kiana made her own map of the field. It used a scale of 1 in. to 20 ft. Whose drawing is larger? Explain your thinking.

1.3 On Kiana's map, the treasure is 2 inches from the south edge of the field. How far is the treasure from the south edge of the field on Ali's map?

1.4 On Kiana's map, the area of the baseball field is 16 square inches. Kiana says that the actual area of the baseball field is 320 square feet. Do you agree or disagree? Explain your reasoning.

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Unit 7.1, Lesson 9: Practice Problems

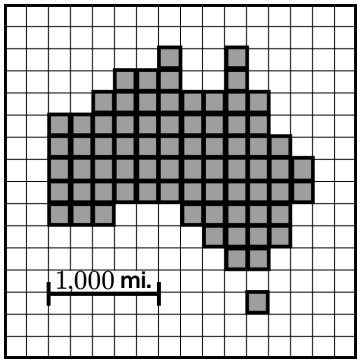
2. The side lengths of polygon A are 3, 6, 6, and 9 inches. Polygon B is a scaled copy of A whose shortest side is 2 inches long. What are the other side lengths of polygon B?

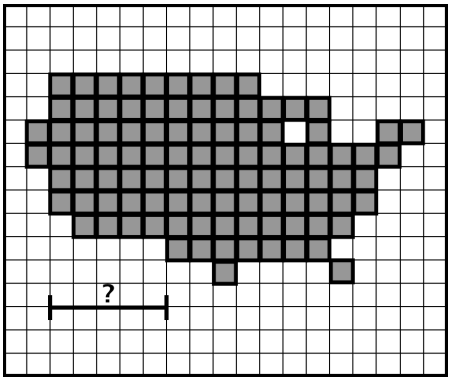
Polygon A (in.)	Polygon B (in.)
3	2
6	
6	
9	

Explore

The continental U.S. is about 200 miles wider than Australia.

What number should replace the question mark on the U.S. map? Explain your strategy.





Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.1, Lesson 9: Practice Problems

Answer Key

Warm-Up

- ✓ 0.75 cm to 1 km
- ☐ 1 cm to $\frac{3}{4}$ km
- ☐ 6 km to 8 cm
- ✓ 7.5 cm to 10 km

Practice

1.1 *Responses vary.*

- 1 in. to 50 ft.
- 2 in. to 100 ft.

1.2 Kiana's drawing.

Explanations vary. On Ali's drawing, the field is 8 inches. On Kiana's drawing, the field is 20 inches wide because $20 \cdot 20 = 400$.

1.3 0.8 inches (or equivalent)

1.4 Disagree.

Explanations vary. When you create a scaled copy, the area is not scaled by the same scale factor, so the area would not be $16 \cdot 20 = 320$ square inches.

2.

Polygon A (in.)	Polygon B (in.)
3	2
6	4
6	4
9	6

Explore

Approximately 750 miles.

Explanations vary. I calculated the width of Australia (which is about $2\,400$ miles) and then added 200 to find the width of the U.S. Then, I realized that each grid unit could be about 150 miles, so the scale would be $150 \cdot 5 = 750$ miles.

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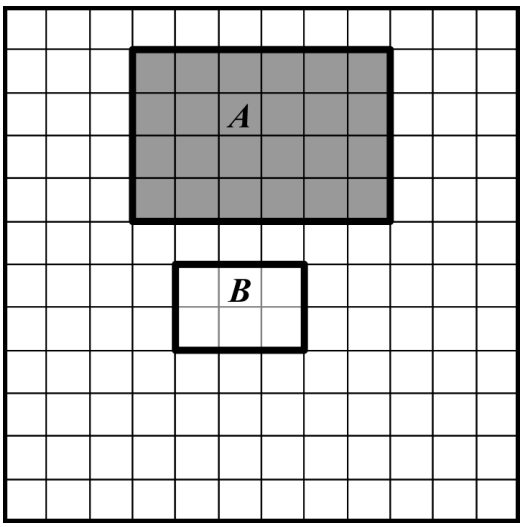
Unit 8.2, Lesson 1: Practice Problems Name _____

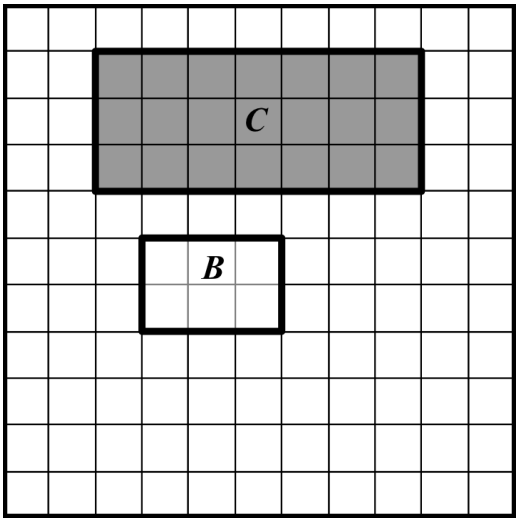
1.1 Is rectangle A similar to rectangle B?

Explain your thinking.

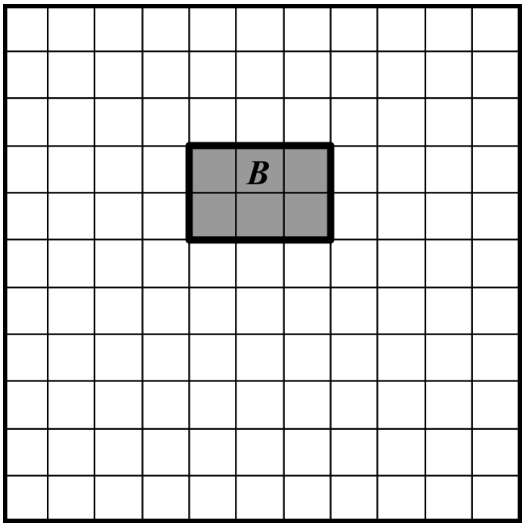


1.2 Is rectangle C similar to rectangle B?

Explain your thinking.



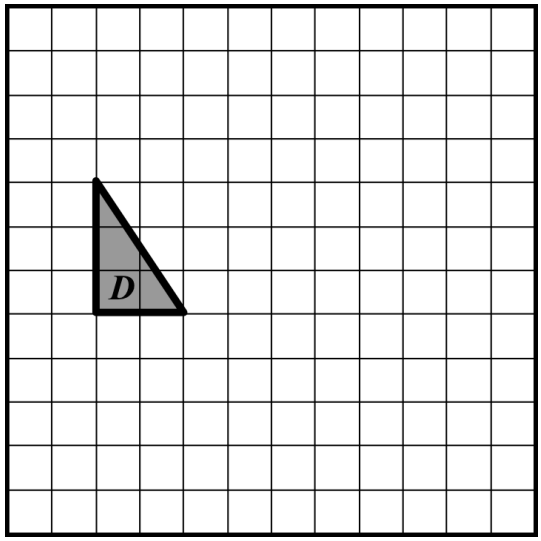
1.3 Draw a different rectangle that is similar to rectangle B.



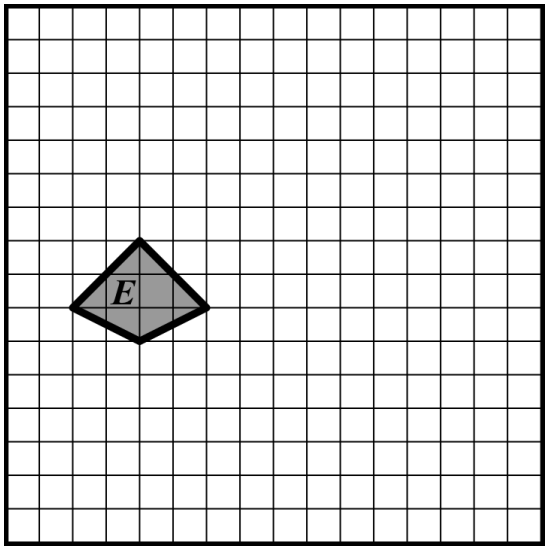
desmos

Unit 8.2, Lesson 1: Practice Problems

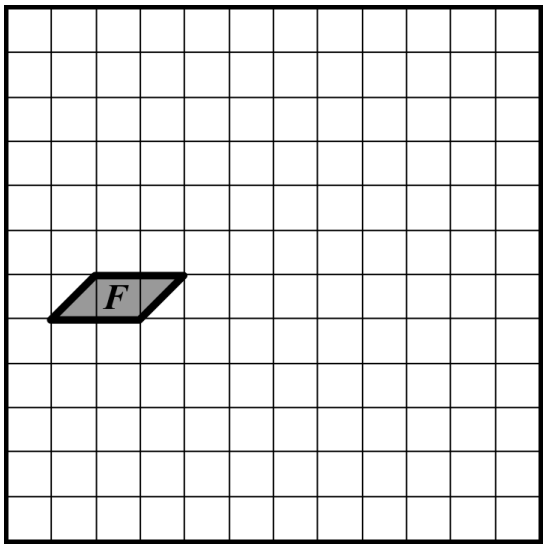
2.1 Draw a figure similar to polygon D.



2.2 Draw a figure similar to polygon E.



2.3 Draw a figure similar to polygon F.



desmos

Unit 8.2, Lesson 1: Practice Problems

Answer Key

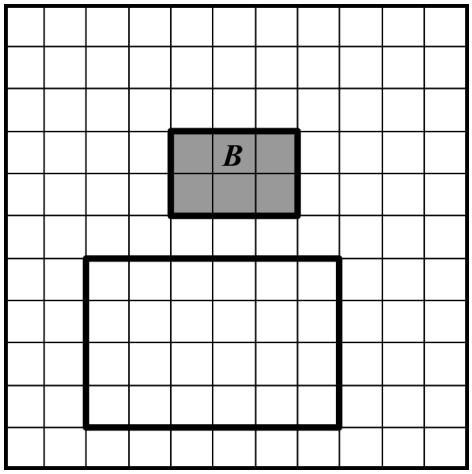
1.1 Yes.

Explanations vary. Rectangle A is double the height and width of rectangle B.

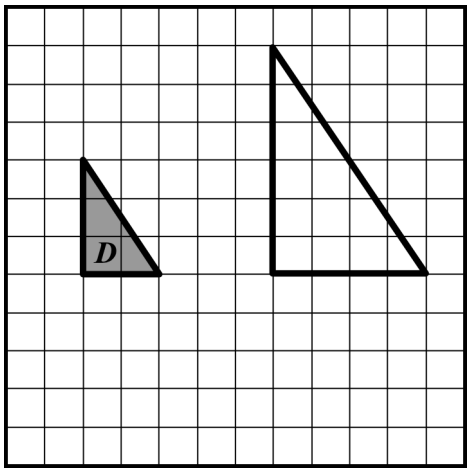
1.2 No.

Explanations vary. Rectangle B has a length to width ratio of 3 to 2, but rectangle C does not.

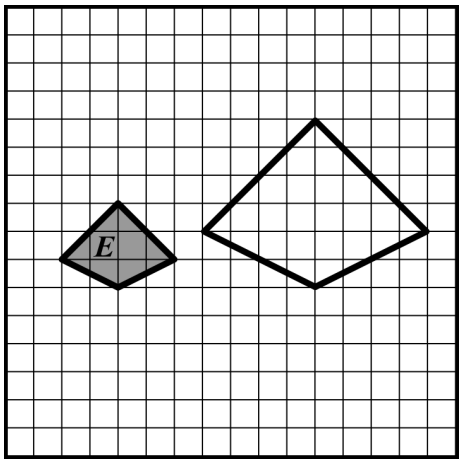
1.3 *Responses vary.*



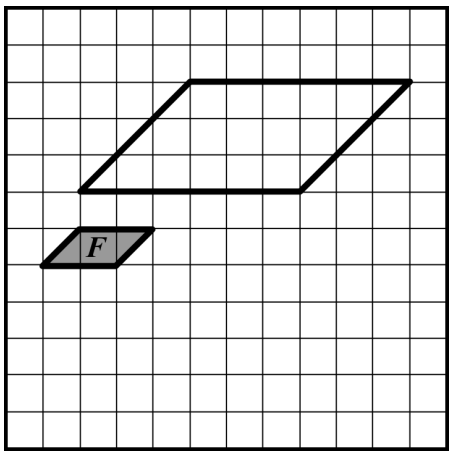
2.1 *Responses vary.*



2.2 *Responses vary.*



2.3 *Responses vary.*



desmos

Unit 8.2, Lesson 2: Practice Problems Name _____

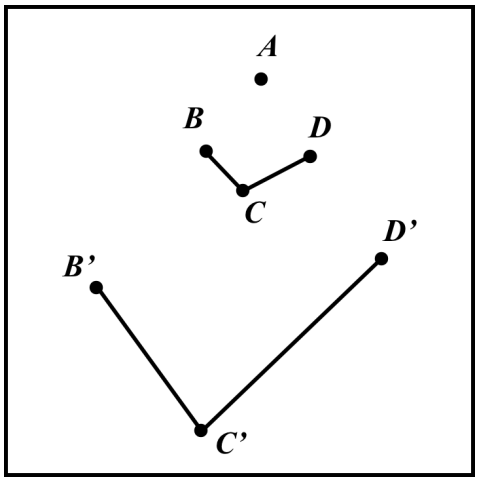
Segment AB is 3 centimeters long. Point O is the center of dilation.

1.1 How long is the image of AB after a dilation with a scale factor of 5?

1.2 How long is the image of AB after a dilation with a scale factor of 3.7?

2. Isaiah claims that $B'C'D'$ is a dilation of BCD using A as the center of dilation.

   Convince Isaiah that his claim is not true.



Triangle ABC is similar to triangle DEF.

Side AB is the longest side of ABC. It measures 12 centimeters.

Side DE is the longest side of DEF. It measures 8 centimeters.

3.1 What is the scale factor that takes triangle ABC to triangle DEF?

3.2 What is the scale factor that takes triangle DEF to triangle ABC?

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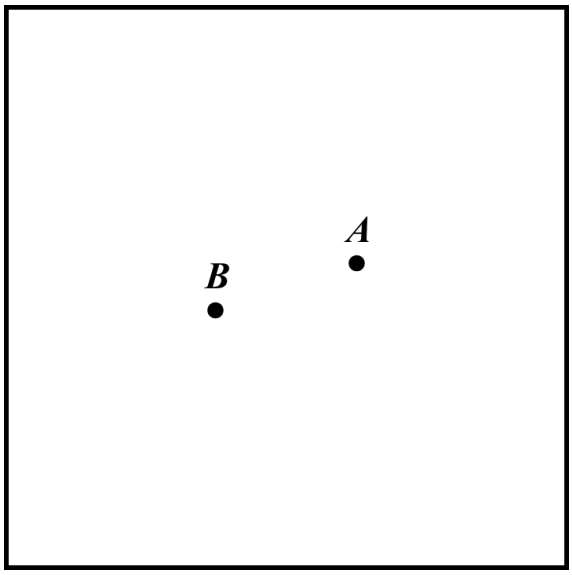
Unit 8.2, Lesson 2: Practice Problems

Here are points A and B.



4.1 C is the image of B using A as the center of dilation and a scale factor of 2.

Plot point C.

4.2 D is the image of A using B as the center of dilation and a scale factor of 2.

Plot point D.

desmos

Unit 8.2, Lesson 2: Practice Problems

Answer Key

1.1 15 cm

1.2 11.1 cm

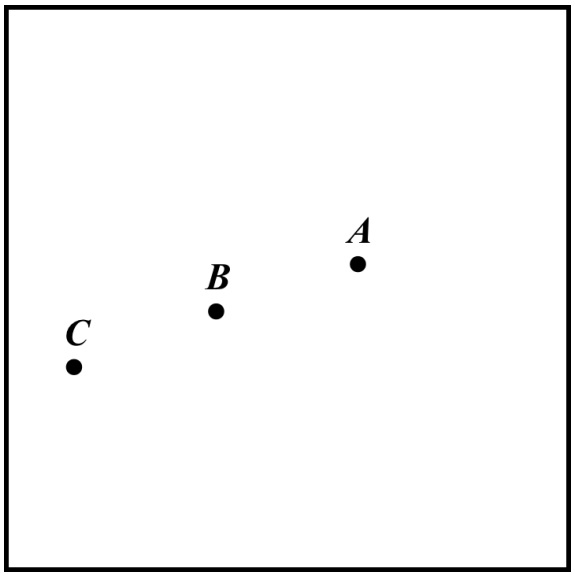
2. *Responses vary.* Below is a list of things that would have to be true if $B'C'D'$ is a dilation of BCD using A as the center of dilation. A complete answer is any answer showing that these statements do not hold.

- $m\angle BCD = m\angle B'C'D'$
- A`, $B$, and $B$` should be collinear.
- A`, C, and C' should be collinear.
- A`, D, and D' should be collinear.
- $B'C'$ should be parallel to BC.
- $C'D'$ should be parallel to CD.

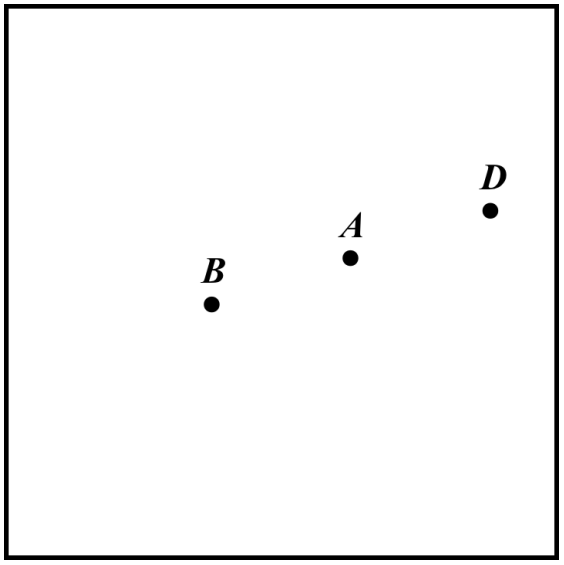
3.1 $\frac{2}{3}$

3.2 $\frac{3}{2}$

4.1



4.2



desmos

Unit 8.2, Lesson 3: Practice Problems Name _____

Segment AB is 3 centimeters long. Point O is the center of dilation.

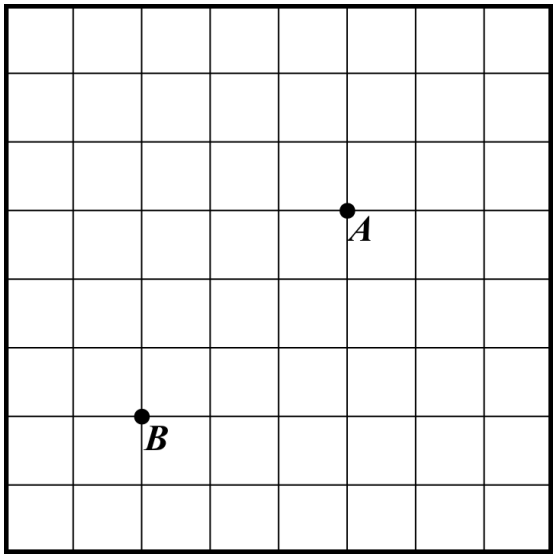
1.1 How long is the image of AB after a dilation with a scale factor of $\frac{1}{5}$?

1.2 How long is the image of AB after a dilation with a scale factor of s?

2. Here are points A and B.

F is the image of B using A as the center of dilation and a scale factor of $\frac{1}{3}$.

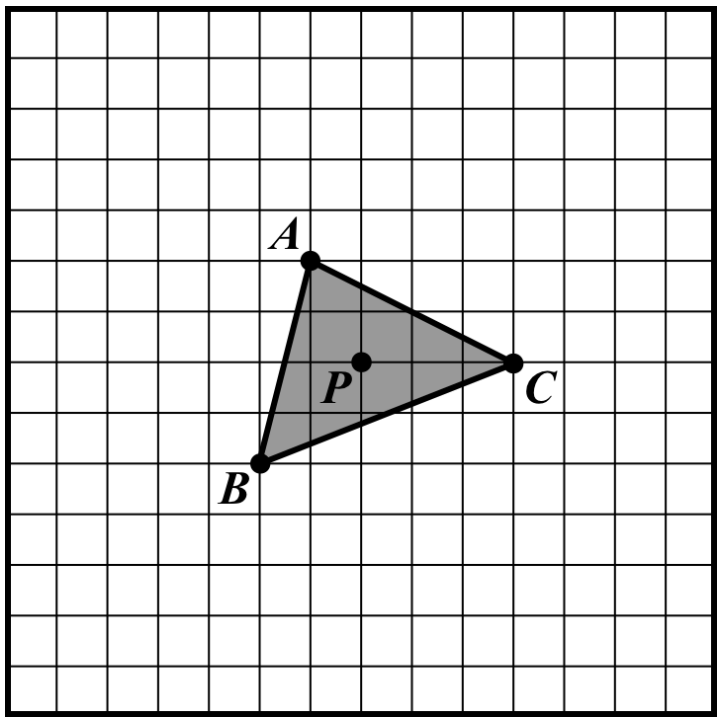
Plot point F.



desmos

Unit 8.2, Lesson 3: Practice Problems

3.1 Dilate each vertex of triangle ABC using P as the center of dilation and a scale factor of 2.



Label the points $A'B'C'$.

3.2 If BC is 5.4 units long, how long is $B'C'$?

If $A'B'$ is 8.2 units long, how long is AB?

3.3 If angle A measures $77.5°$, what is the measure of angle A'?

If angle B measures $54.2°$, what is the measure of angle B'?

If angle C measures $48.3°$, what is the measure of angle C'?

desmos

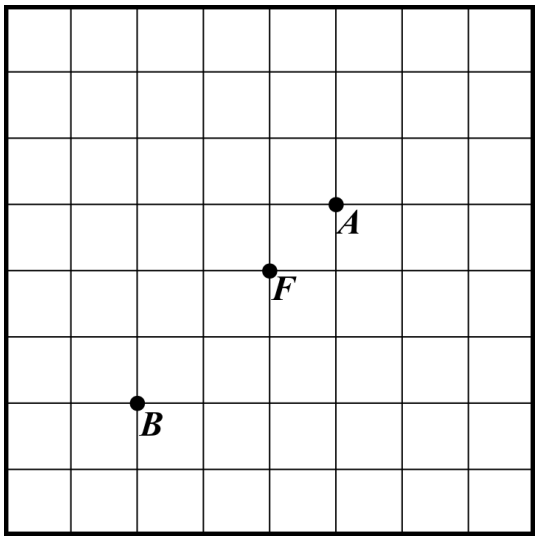
Unit 8.2, Lesson 3: Practice Problems

Answer Key

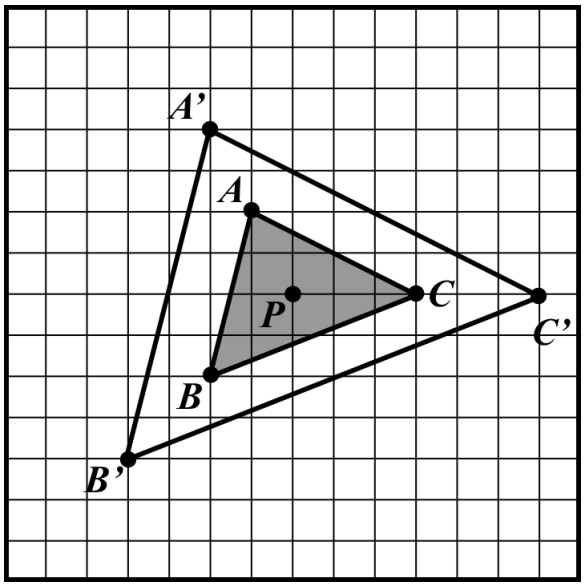
1.1 $\frac{3}{5}$ cm

1.2 $3s$ cm

2.



3.1



3.2

- **Side** $B'C'$**:** 10.8
- **Side** AB**:** 4.1

3.3 Angle A': 77.5°

Angle B': 54.2°

Angle C': 48.3°

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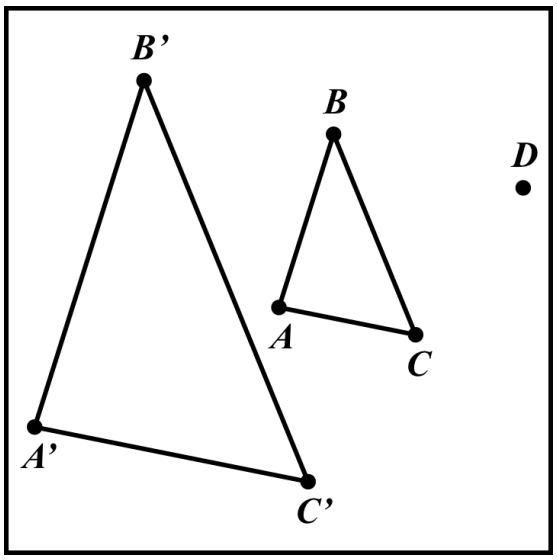
Unit 8.2, Lesson 4: Practice Problems Name _____

1. Triangle ABC is dilated using center D with a scale factor 2. The image is triangle $A'B'C'$.

   Cho says the two triangles are congruent because their angle measures are the same.

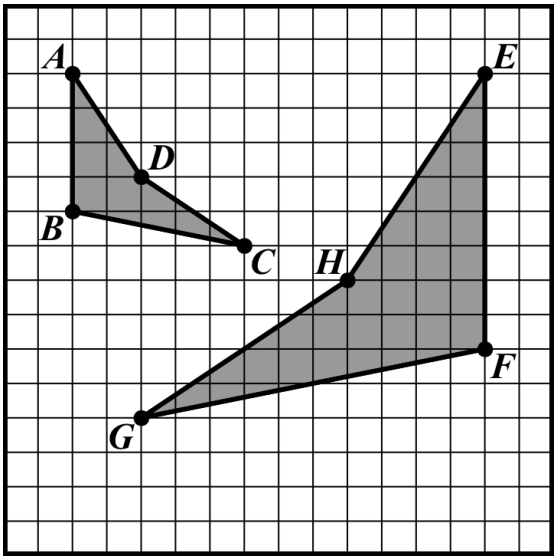
   Do you agree? Explain your thinking.



Here are two similar polygons.

2.1 Use a ruler to find the side lengths of both polygons.

Describe what you notice.



2.2 Use a protractor to find the angle measures of both polygons.

Describe what you notice.

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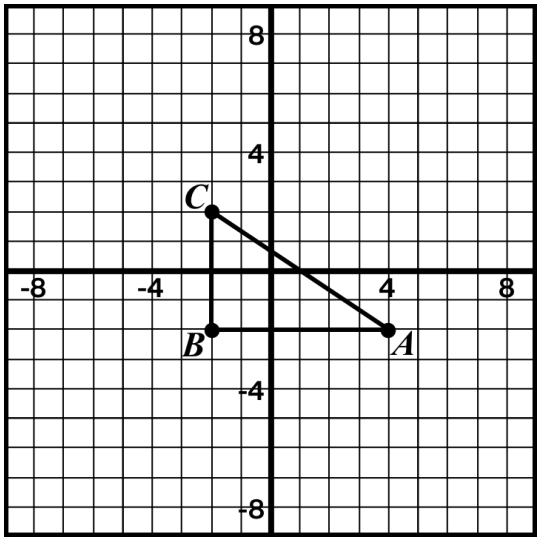
Unit 8.2, Lesson 4: Practice Problems

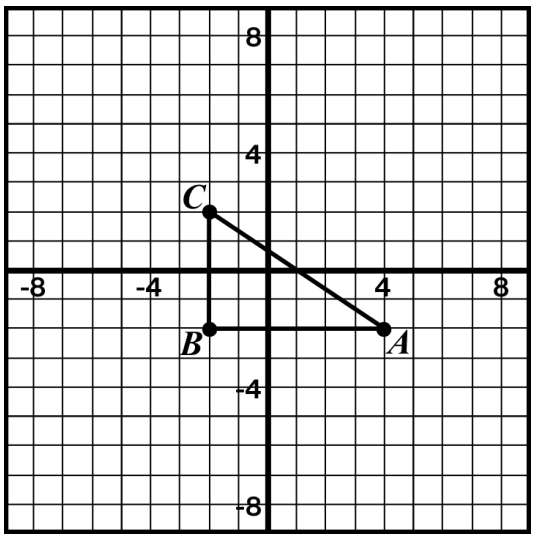
3.1 Draw the dilation of triangle ABC with center $(0, 0)$ and a scale factor of 2.

Label this triangle $A'B'C'$.



3.2 Draw the dilation of triangle ABC with center $(0, 0)$ and a scale factor of $\frac{1}{2}$.

Label this triangle $A''B''C''$.



3.3 Describe the dilations from $A'B'C'$ to $A''B''C''$.

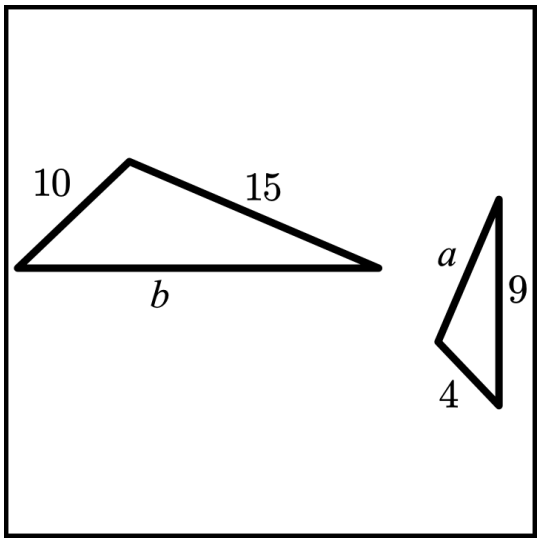
4. These two triangles are similar.

What are a and b?

Note: The two figures are not drawn to scale.

$a =$ _____

$b =$ _____



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Unit 8.2, Lesson 4: Practice Problems

Answer Key

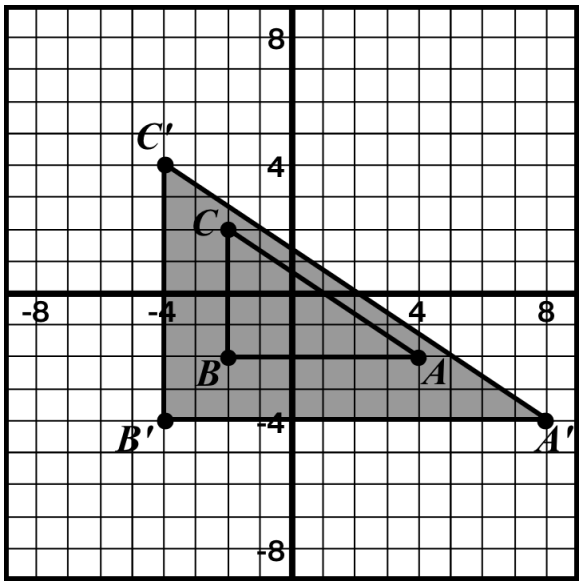
1. No.

   Explanations vary. The triangles are not congruent because their side lengths are different.

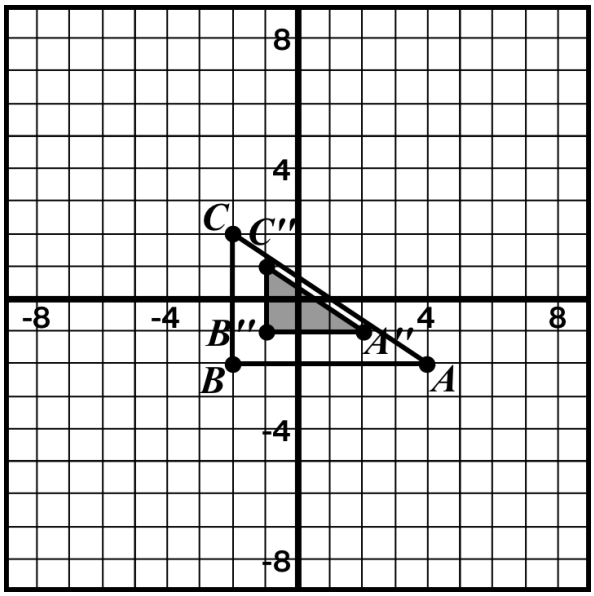
2.1 *Responses vary.* Corresponding side lengths in the larger polygon are double the side lengths of the smaller polygon.

2.2 *Responses vary*. Corresponding angles all have the same measure.

3.1



3.2



3.3 $A''B''C''$ is a dilation of $A'B'C'$ with center $(0, 0)$ and a scale factor of $\frac{1}{4}$.

4. $a = 6$

   $b = 22.5$

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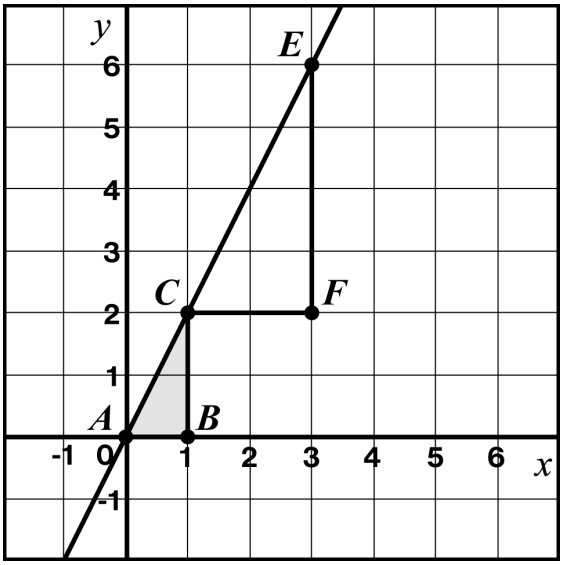
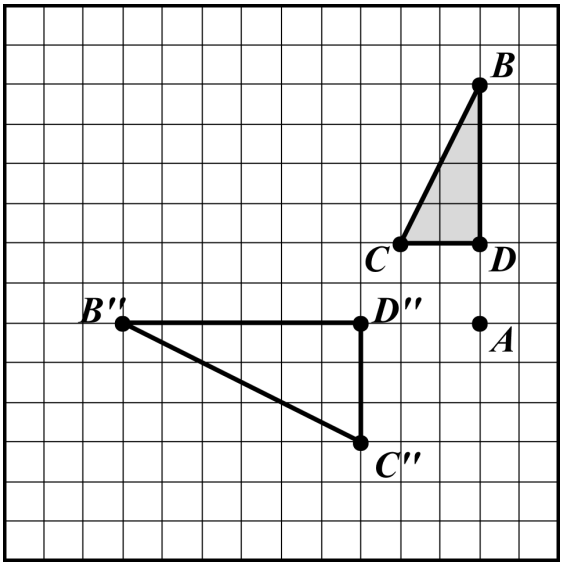
Unit 8.2, Lesson 5: Practice Problems Name _____

1.1 Describe a sequence of translations, rotations, reflections, and dilations to show that the figures are similar.



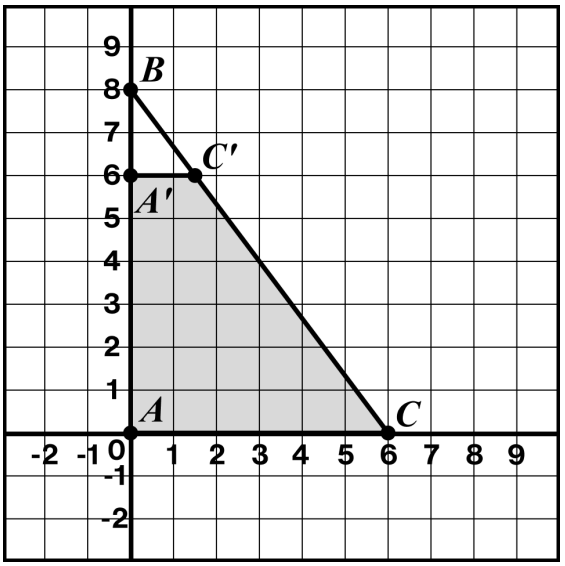
1.2 Describe a sequence of translations, rotations, reflections, and dilations to show that the figures are similar.



2. Here are two similar triangles.

What point is the center of dilation?

Find the length of segment $A'C'$.



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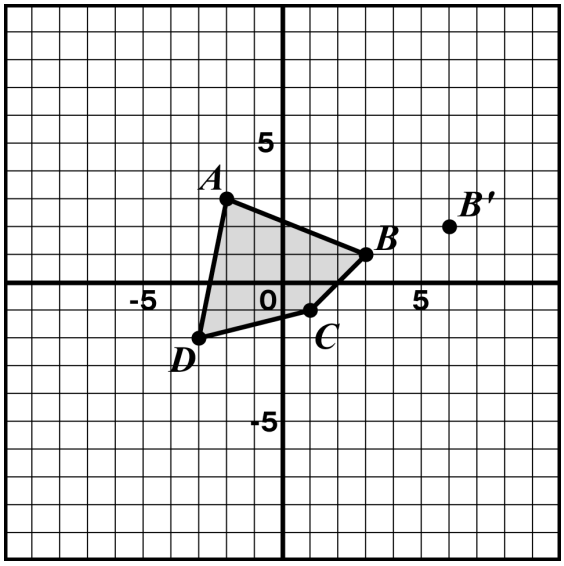
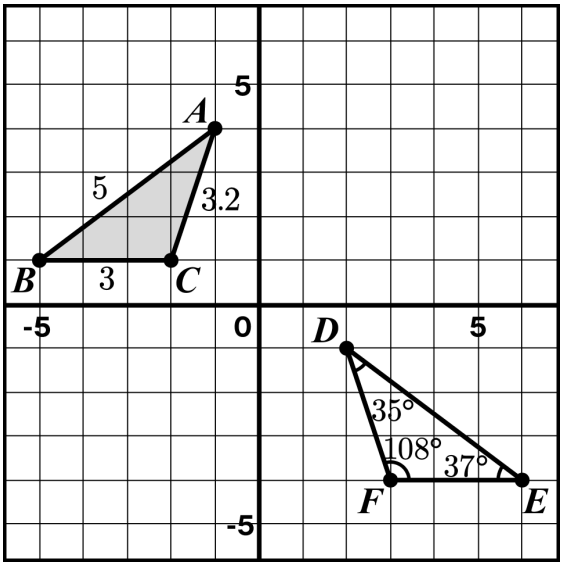
Unit 8.2, Lesson 5: Practice Problems

3. Quadrilateral $ABCD$ is dilated using center $(0, 0)$ so that B goes to B'.

   Draw $A'B'C'D'$. B' is graphed for you.



4.1 Describe a sequence of transformations to show that the two triangles are congruent.



4.2 Enter the side lengths of DEF.

Side	Length
DE	
EF	
DF	

4.3 Enter the angle measures of ABC.

Angle	Measure (degrees)
$\angle ABC$	
$\angle BCA$	
$\angle CAB$	

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Unit 8.2, Lesson 5: Practice Problems

Answer Key

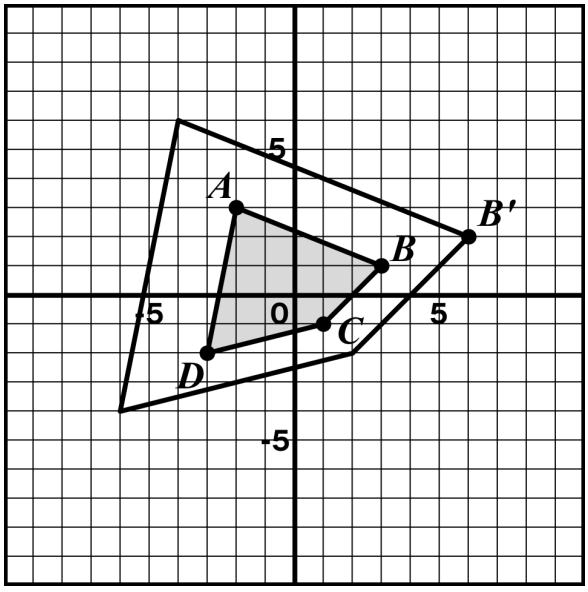
1.1 These two figures are similar because you can translate A to C and dilate using A as the center and a scale factor of 2 to map triangle ABC onto triangle CFE.

1.2 These two figures are similar because you can rotate $90°$ counterclockwise around center A and then dilate using A as the center of dilation and a scale factor of 1.5.

2. **Center of dilation:** B

   Length of $A'C'$: 1.5 units

3.



4.1 (From Unit 1, Lesson 12)

The triangles are congruent because you can reflect across the y-axis and then translate until A meets D.

4.2 (From Unit 1, Lesson 12)

Side	Length
DE	5
EF	3
DF	3.2

4.3 (From Unit 1, Lesson 12)

Angle	Measure (degrees)
$\angle ABC$	37°
$\angle BCA$	108°
$\angle CAB$	35°

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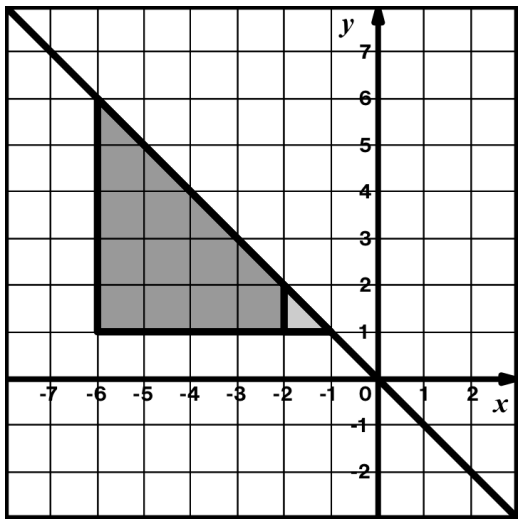
Unit 8.2, Lesson 6: Practice Problems Name _____

1. Here are the pre-image and image of a dilation.

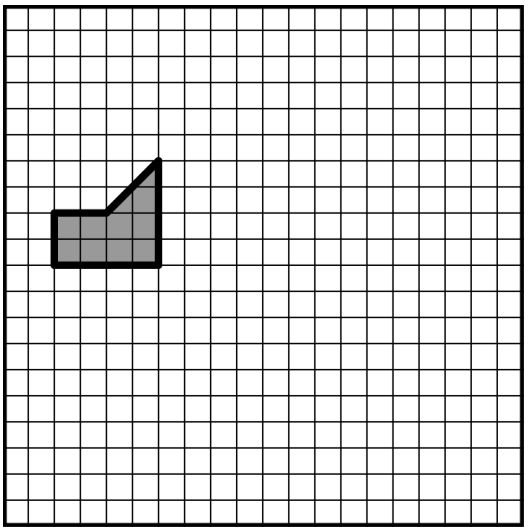


   The pre-image is the large triangle. The image is the small triangle.

   What is the center of dilation?

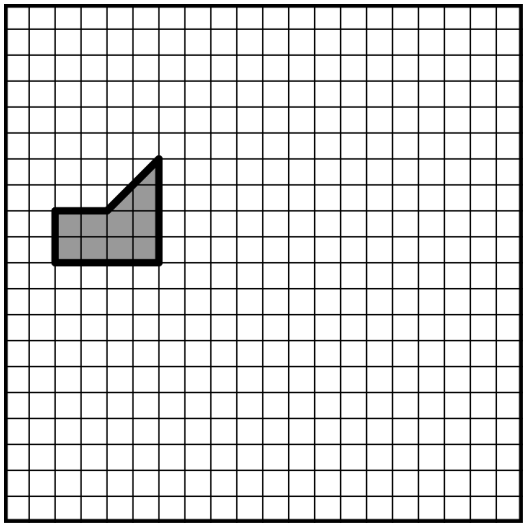
   What is the scale factor needed to go from the large triangle to the small triangle?

Here is a polygon.



2.1 Draw a similar polygon that could be mistaken for being NOT similar.

2.2 Draw a NOT similar polygon that could be mistaken for a similar polygon.



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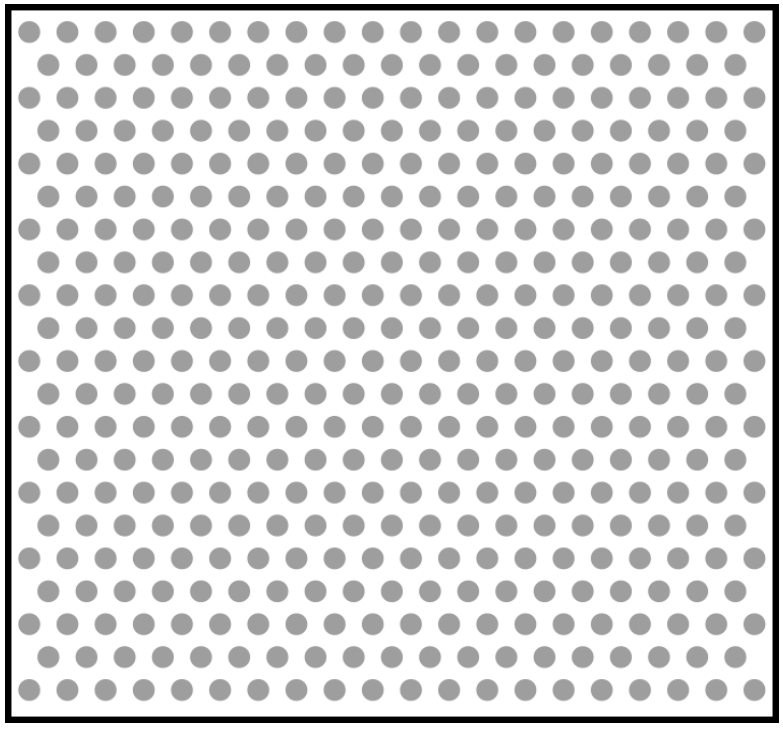
Unit 8.2, Lesson 6: Practice Problems

3.1 Use the grid below to draw two equilateral triangles that are **not** congruent.



3.2 Are the two triangles similar? Use distances or angle measurements to justify your claim.

3.3 When will two equilateral triangles be similar?

A. Always
B. Sometimes
C. Never

Explain your thinking.

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Unit 8.2, Lesson 6: Practice Problems

Answer Key

1. (From Unit 2, Lesson 4)

   Center: $(-1, 1)$

   Scale factor: $\frac{1}{5}$

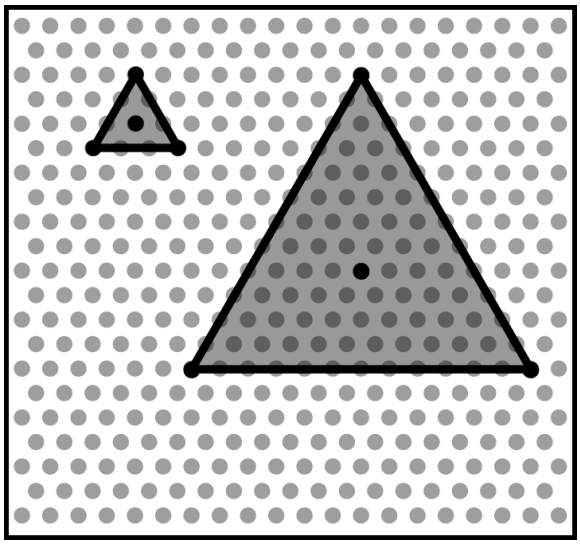
2.1 *Responses vary.*

- Two congruent polygons with different orientations.
- Two polygons where a reflection moves one to the other.

2.2 *Responses vary.*

- Two polygons with the same angle measures but side lengths that are not proportional.
- Two polygons with proportional side lengths but incongruent angle measures.

3.1 *Responses vary.*



3.2 *Responses vary.*

The side lengths in each triangle should be equal, and the angle measures should all be $60°$. The triangles are similar because the angle measures are equal and the sides are proportional.

3.3 Always.

Explanations vary. All equilateral triangles have the same angle measures, so they are all similar.

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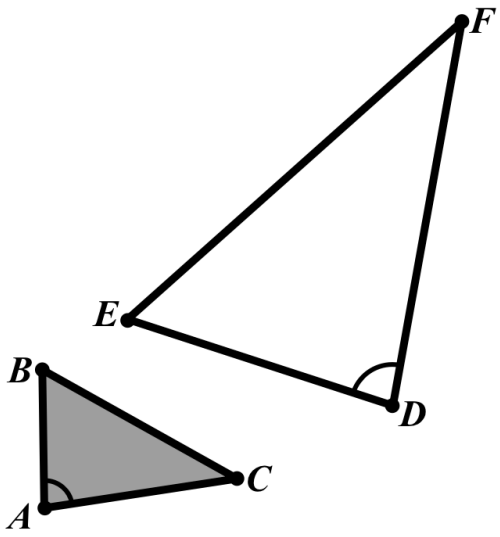
Unit 8.2, Lesson 7: Practice Problems Name _____

1. Triangle DEF is similar to triangle ABC with a scale factor of 2.

   In triangle ABC, the largest angle measures $82°$.

   What is the largest angle measure in triangle DEF?

   - ☐ $41°$
   - ☐ $82°$
   - ☐ $123°$
   - ☐ $164°$



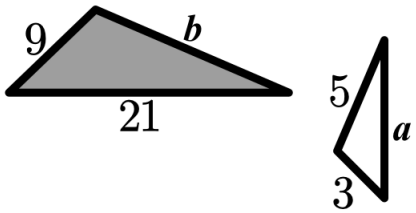
2. These two triangles are similar.

   Find side lengths a and b.

   Note: The two figures are not drawn to scale.

   a =_____

   b = _____



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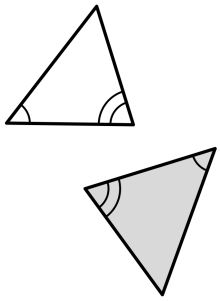
Unit 8.2, Lesson 7: Practice Problems

For each pair of triangles, some of the angles measures are given. **Decide if the triangles are similar or not.**

3.1 **Triangle A:** $53°$, $71°$, ____°
Triangle B: $53°$, $71°$, ____°

- ☐ Similar
- ☐ Not similar
- ☐ Not enough info

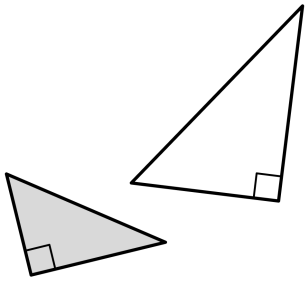
Explain your thinking.



3.2 **Triangle C:** $90°$, $37°$, ____°
Triangle D: $90°$, $53°$, ____°

- ☐ Similar
- ☐ Not similar
- ☐ Not enough info

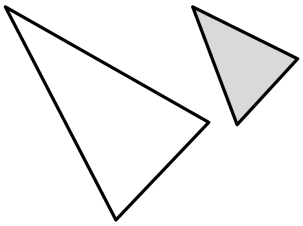
Explain your thinking.



3.3 **Triangle E:** $63°$, $45°$, ____°
Triangle F: $30°$, $71°$, ____°

- ☐ Similar
- ☐ Not similar
- ☐ Not enough info

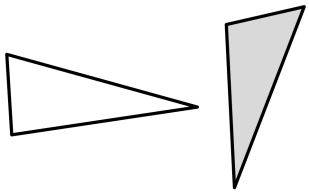
Explain your thinking.



3.4 **Triangle G:** $100°$, ____°, ____°
Triangle H: $65°$, ____°, ____°

- ☐ Similar
- ☐ Not similar
- ☐ Not enough info

Explain your thinking.



4.1 Triangle A has side lengths 3, 4, and 5. Triangle B has side lengths 6, 7, and 8.

Explain how you know that triangle B is not similar to triangle A.

4.2 Triangle C is similar to triangle A.

Write possible side lengths for triangle C.

Side	Triangle A	Triangle C
Shortest	3	
Medium	4	
Longest	5	

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Unit 8.2, Lesson 7: Practice Problems

Answer Key

1. $82°$

2. $a = 7$

   $b = 15$

3.1 Similar.

The triangles have two pairs of angles with equal measurement.

3.2 Similar.

Since the angles in a triangle add up to $180°$, the missing angle in triangle C must be $53°$. The two triangles, therefore, have two pairs of angles with equal measurement, so they are similar.

3.3 Not similar.

Similar triangles have equal angle measurements, and there is no way to fill in the blanks so that this is true for both triangles.

3.4 Not enough information.

The triangles could only be similar if both triangles also had an angle of $15°$ since the third angle of triangle G would be $180° - (100° + 15°) = 65°$ and the third angle of triangle H would be $180° - (65° + 15°) = 100°$.

4.1 *Responses vary.* The shortest side in triangle B is twice as long, but the longest side is only 1.6 times as long. These different ratios mean the triangles cannot be similar.

4.2 *Responses vary.*

Side	Triangle A	Triangle C
Shortest	3	6
Medium	4	8
Longest	5	10

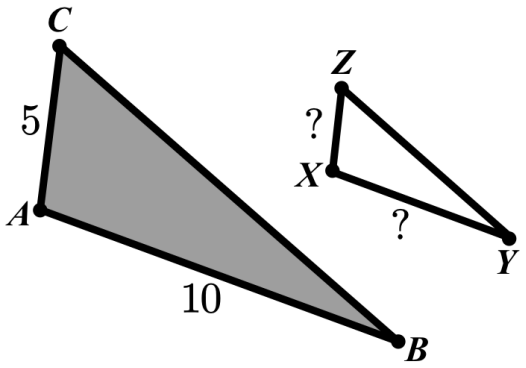
desmos

Unit 8.2, Lesson 8: Practice Problems Name _____

1.1 Triangle XYZ is similar to ABC with a scale factor of $\frac{1}{2}$.

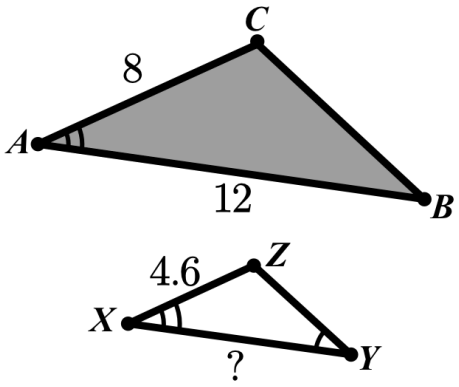
What is the length of XY ? _____

What is the length of XZ ? _____



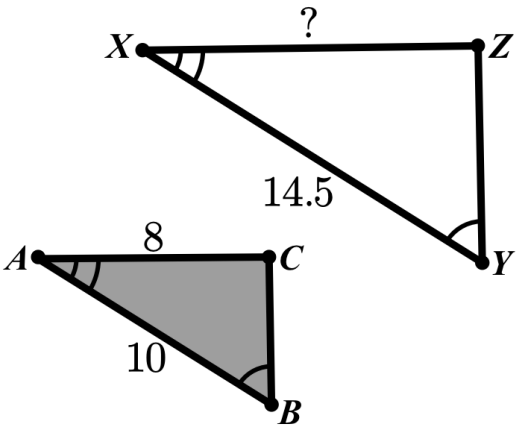
1.2 Triangle XYZ is similar to ABC.

What is the length of XY ?_____



1.3 Triangle XYZ is similar to ABC.

What is the length of XZ ?_____



desmos

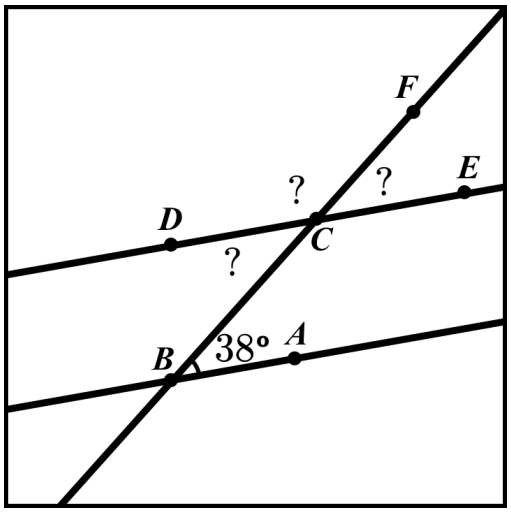
Unit 8.2, Lesson 8: Practice Problems

2. Which of these sets of angle measures could be the three angles in a triangle?

- ☐ $40°, 50°, 60°$
- ☐ $50°, 60°, 70°$
- ☐ $60°, 70°, 80°$
- ☐ $70°, 80°, 90°$

3. Lines AB and CD are parallel.

What are the measurements of the following angles?



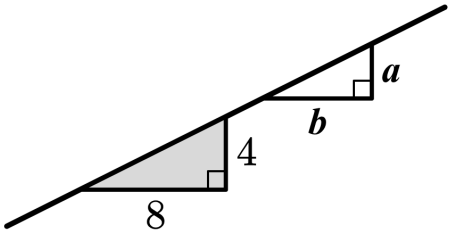
Angle BCD:_____

Angle ECF:_____

Angle DCF:_____

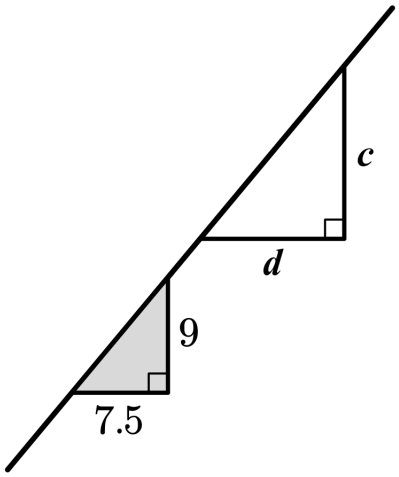
Explain your reasoning.

4.1 These two triangles are similar.



Find the value of $\frac{a}{b}$.

4.2 These two triangles are similar.



Find the value of $\frac{c}{d}$.

desmos

Unit 8.2, Lesson 8: Practice Problems

Answer Key

1.1 Length of XY: 5
Length of XZ: 2.5

1.2 Length of XY: 6.9

1.3 Length of XZ: 11.6

2. (From Unit 1, Lesson 12)

✓ $50°$, $60°$, $70°$

3. (From Unit 1, Lesson 10)

- Angle $BCD = 38°$. Angle BCD and angle ABC are congruent angles on the parallel lines AB and CD cut by the transversal BC.
- Angle $ECF = 38°$. Angle ECF and angle BCD are a pair of vertical angles.
- Angle $DCF = 142°$. Angle DCF and angle ECF are supplementary angles.

4.1 $\frac{1}{2}$ (or equivalent)

4.2 $\frac{6}{5}$ (or equivalent)

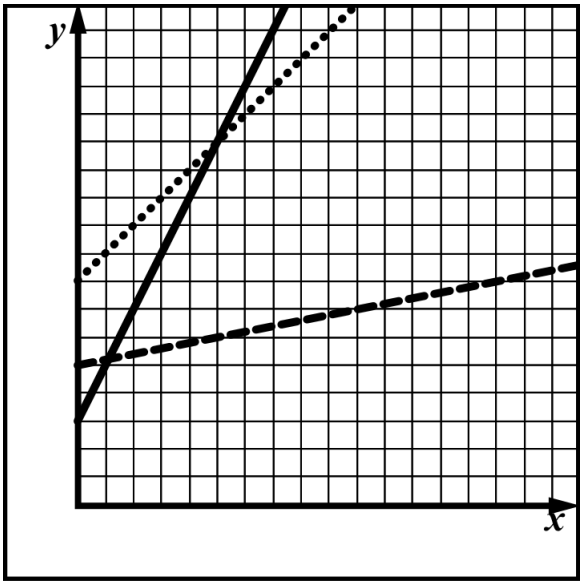
desmos

Unit 8.2, Lesson 9: Practice Problems Name _____

1. Here are three lines.

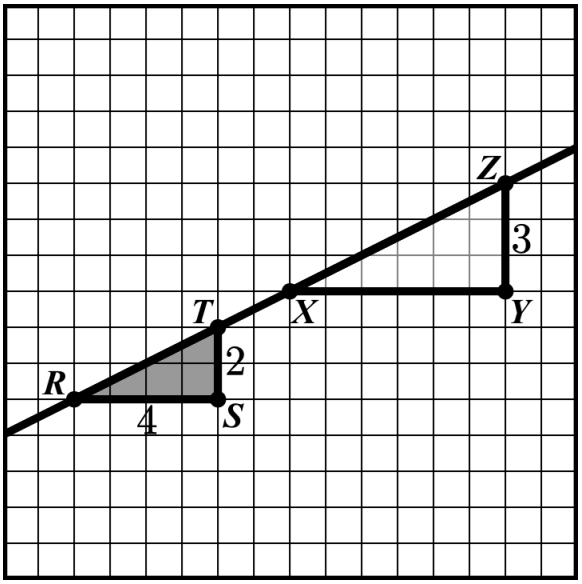
   Their slopes are 1, 2, and $\frac{1}{5}$.

   Label each line with its slope.



Here are two right triangles.

The longest side of each triangle is on the line.



2.1 How long is segment XY ?

2.2 Explain how you know the triangles are similar.

2.3 What is the slope of the line?

Explain your thinking.

desmos

Unit 8.2, Lesson 9: Practice Problems

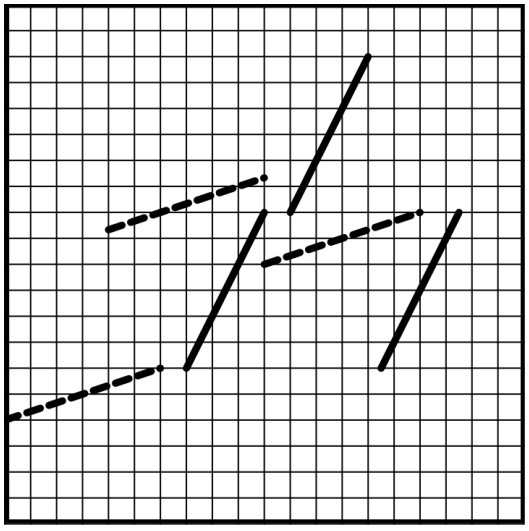
3. The slope of all of the solid lines are the same.

   The slope of all of the dashed lines are the same.

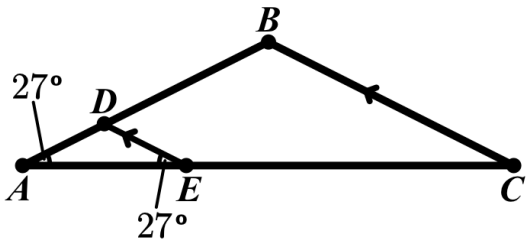
   What is the slope of each?

   Slope of solid lines: _____

   Slope of dashed lines: _____



4. In this figure, line BC is parallel to line DE. Explain why triangle ABC is similar to triangle ADE.



desmos

Unit 8.2, Lesson 9: Practice Problems

Answer Key

1. **Dotted:** 1
   Solid: 2
   Dashed: $\frac{1}{5}$

2.1 6 units

2.2 *Responses vary.* Translating R to X and then dilating shows that there is a sequence of translations, rotations, reflections, and dilations that can take one triangle to the other.

2.3 The slope of the line is $\frac{1}{2}$. It is the quotient of the vertical side length of a slope triangle and the horizontal side length of a slope triangle. These both give the same value because the slope triangles are similar.

3. **Solid:** 2
   Dashed: $\frac{1}{3}$

4. (From Unit 2, Lesson 7) *Responses vary.*

   - Triangles ABC and ADE share angle A. Line AC is a transversal for parallel lines BC and DE. Therefore, angles ADE and ABC are congruent. Since they share two congruent angles, the two triangles are congruent.
   - A dilation with center A and an appropriate scale factor will take triangle ABC to triangle ADE. The scale factor looks like it is about 3.

desmos

Unit 7.6, Lesson 1: Practice Problems Name _____

Warm-Up

Complete each equation using the symbols $\times$, $\div$, $+$, or $-$.

$48 \_\_ (-8) = -6$ $(-40) \_\_ 8 = -5$ $12 \_\_ (-2) = 14$ $18 \_\_ (-12) = 6$

Practice

A sandwich store charges $\$20$ to have 3 subs delivered and $\$26$ to have 4 subs delivered.

1.1 How much does the store charge for each additional sub?

1.2 Is the relationship between the number of subs delivered and the amount charged proportional?

Explain how you know.

1.3 If the total charge is $\$56$, how many subs are in the order?

1.4 Explain how the store determines the price for any number of subs delivered.

desmos

Unit 7.6, Lesson 1: Practice Problems

Maneli and Santiago are trying to solve the equation $\frac{2}{3} + x = \frac{1}{3}$.

- Maneli says, "I think we should multiply each side by $\frac{3}{2}$ because that is the reciprocal of $\frac{2}{3}$."
- Santiago says, "I think we should add $-\frac{2}{3}$ to each side because that is the opposite of $\frac{2}{3}$."

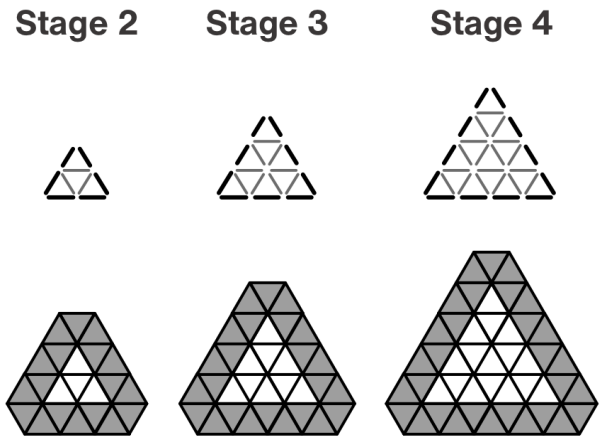
2.1 Which person's strategy should they use? _____ Why?

2.2 Write an equation that can be solved using the other person's strategy.

Explore

Here are scaled copies of the same figure. The top three have a toothpick border and the bottom three have a tile border.

Complete the table to show the number of toothpicks and tiles for different stages.



Stage	Border Toothpicks	Border Triangles
2		
3		
4		
5		
6		

Reflect

1. Draw a star next to your favorite question on this worksheet.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 1: Practice Problems

Answer Key

Warm-Up

$\div$, $\div$, $-$, $+$

Practice

1.1 $\$6$

1.2 No.

Responses vary. If they deliver 3 turkey subs, they charge $\$6.67$ per sub, but for 4 subs, they charge $\$6.50$ per sub.

1.3 9 subs

1.4 *Responses vary.* The store charges $\$6$ per sub, plus and an additional $\$2$ fee.

2.1 Santiago

Responses vary. The operation in the expression $\frac{2}{3} + x$ is addition. Adding the additive inverse of $\frac{2}{3}$ to both sides of the equation will change the equation to the form $x =$.

2.2 *Responses vary.* $\frac{2}{3}$ $x = 4$

Explore

Stage	Border Toothpicks	Border Triangles
2	6	18
3	9	24
4	12	30
5	15	36
6	18	42

desmos

Unit 7.6, Lesson 2: Practice Problems Name _____

Warm-Up

Determine the value of the variable that makes each equation true.

$8.5 \cdot (-3) = a$ $(-7) + b = -11$ $c - (-3) = 15$ $d \cdot (-4) = 32$

Practice

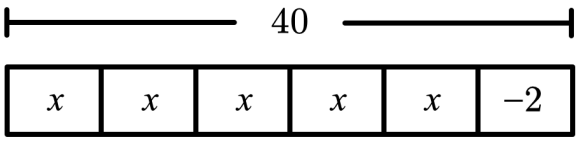
Solve each equation.

1.1 $2x = 10$ 1.2 $-3x = 21$ 1.3 $\frac{1}{3}x = 6$ 1.4 $-\frac{1}{2}x = -7$

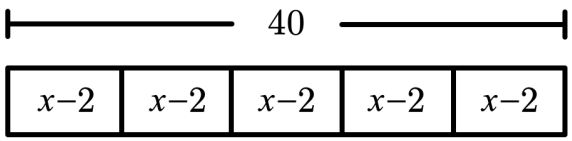
Axel wants to save $\$40$ to buy a gift for his friend. His neighbor pays him weekly to mow the lawn, and he donates $\$2$ of what he earns each week to charity. Axel calculates that it will take him 5 weeks to earn enough for his friend's gift.

2.1 Which tape diagram represents this situation?

A



B



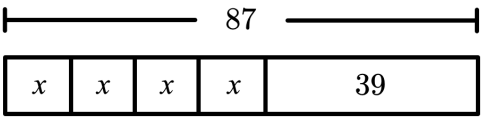
2.2 Explain how the parts of the tape diagram represent the story.

2.3 How much does Axel's neighbor pay him each week to mow the lawn?

desmos

Unit 7.6, Lesson 2: Practice Problems

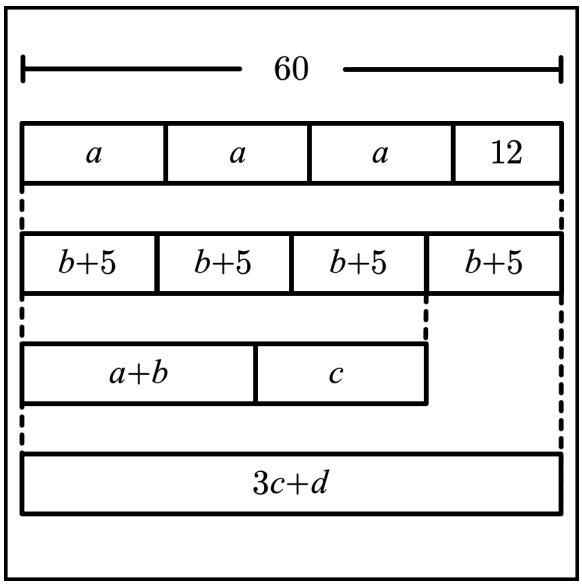
3. Select **all** the stories that the tape diagram can represent.



- ☐ There are 87 first graders in school. After 39 students are picked up, the teachers put the remaining students into 4 groups for an activity.
- ☐ Latifa buys a pack of 87 pencils. She gives 39 to her teacher and shares the remaining pencils between herself and 3 friends.
- ☐ Emiliano buys 4 packs of paper clips with 39 paper clips in each. Then he gives 87 paper clips to his teacher.
- ☐ Shanice's family buys 4 tickets to a fair and spends $\$39$ on dinner. They spend $\$87$ total.

Explore

Determine the values of a, b, c, and d.



Variable	Value
a	
b	
c	
d	

Reflect

1. Put a smiley face next to the question you spent most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 2: Practice Problems

Answer Key

Warm-Up

- $a = -25.5$
- $b = -4$
- $c = 12$
- $d = -8$

Practice

1.1 $x = 5$

1.2 $x = -7$

1.3 $x = 18$

1.4 $x = 14$

2.1 B

2.2 *Responses vary.* The 5 equal parts represent the 5 weeks. Each week, Axel will earn x dollars for mowing his neighbor's lawn and donate $\$2$, so he will save $x - 2$ dollars. In 5 weeks, he will save a total of $\$40$.

2.3 $\$10$

3.
- ✓ There are 87 first graders in school. After 39 students are picked up, the teachers put the remaining students into 4 groups for an activity.
- ✓ Latifa buys a pack of 87 pencils. She gives 39 to her teacher and shares the remaining pencils between herself and 3 friends.
- ✓ Shanice's family buys 4 tickets to a fair and spends $\$39$ on dinner. They spend $\$87$ total.

Explore

Variable	Value
a	16
b	10
c	19
d	3

desmos

Unit 7.6, Lesson 3: Practice Problems Name _____

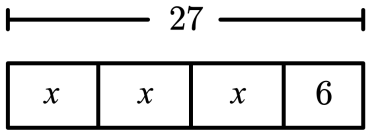
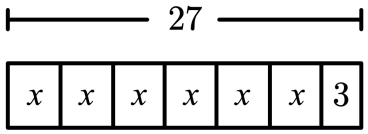
Warm-Up

Determine the value of each expression.

$(100) \cdot (-0.09)$ $(-7) \cdot (-1.1)$ $(-7.3) \cdot (5)$ $(-0.2) \cdot (-0.3)$

Practice

Here are two stories, two tape diagrams, and two equations.

Story #1: A family buys 6 tickets to a show. They also pay a $\$3$ parking fee. They spend $\$27$ total.	A. 	$3x + 6 = 27$
Story #2: Diego has 27 ounces of juice. He pours equal amounts for each of his 3 friends and has 6 ounces left for himself.	B. 	$6x + 3 = 27$

	Story #1	Story #2
1.1 Decide which tape diagram and equation represents each story.	Tape diagram:_____ Equation:_____	Tape diagram:_____ Equation:_____
1.2 What does x represent in each equation?		
1.3 Determine the value of x. Explain or show your reasoning.		
1.4 What does each solution tell you about its story?		

desmos

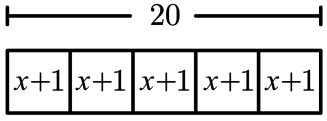
Unit 7.6, Lesson 3: Practice Problems

Match each equation with a tape diagram.

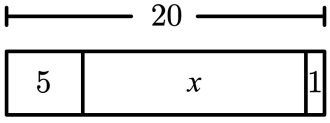
2.1 $5(x+1)=20$

2.2 $5x+1=20$

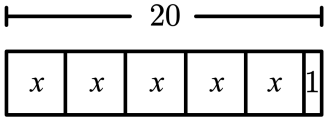
A.



B.



C.



Determine the number of miles each car can travel in 1 hour assuming they drive at a constant speed.

3.1 135 mi. in 3 hr.

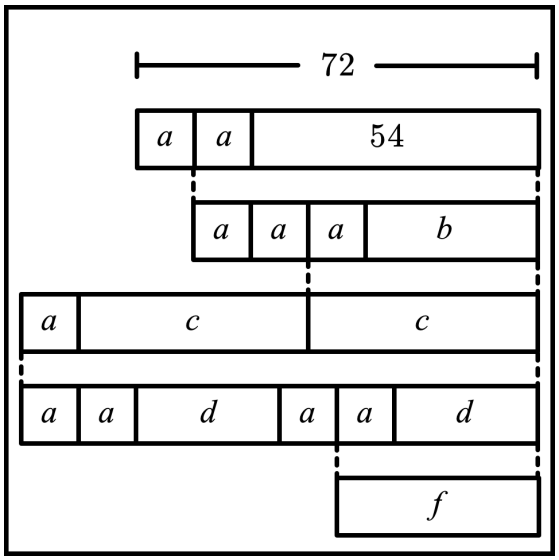
3.2 22 mi. in $\frac{1}{2}$ hr.

3.3 7.5 mi. in $\frac{1}{4}$ hr.

3.4 $97\frac{1}{2}$ mi. in $\frac{3}{2}$ hr.

Explore

Determine the value of each variable.



Variable	Value
a	
b	
c	
d	
f	

Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 3: Practice Problems

Answer Key

Warm-Up

-9, 7.7, -36.5, 0.06

Practice

	Story 1	Story 2
1.1 Decide which tape diagram and equation represents each story.	**Tape diagram:** B **Equation:** $6x + 3 = 27$	**Tape diagram:** A **Equation:** $3x + 6 = 27$
1.2 What does x represent in each equation?	x represents the cost of a ticket.	x represents the number of ounces of juice he gives each friend.
1.3 Determine the value of x. Explain or show your reasoning.	$6x + 3 = 27$ $x = 4$	$3x + 6 = 27$ $x = 7$
1.4 What does each solution tell you about its situation?	Each ticket to the show costs $\$4$.	Diego gives each friend 7 ounces of juice.

2.1 A

2.2 C

3.1 45 miles 3.2 44 miles 3.3 30 miles 3.4 65 miles

Explore

Variable	Value
a	9
b	36
c	45
d	31.5
f	40.5

desmos

Unit 7.6, Lesson 4: Practice Problems Name _____

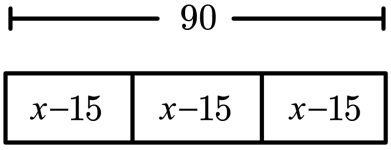
Warm-Up

Determine the value of each expression.

$\frac{2}{3} \cdot \left(\frac{-4}{5}\right)$ $\left(\frac{-5}{7}\right) \cdot \left(\frac{7}{5}\right)$ $\left(\frac{-2}{39}\right) \cdot 39$ $\left(\frac{2}{5}\right) \cdot \left(\frac{-3}{4}\right)$

Practice

1. A school ordered 3 large boxes of markers. After giving 15 markers to each of 3 teachers, there were 90 markers left. The diagram represents the situation.



How many markers were originally in each box?

Here are two stories and two equations.

Story #1: A family buys 6 tickets to a show. They also each spend $\$3$ on a snack. They spend $\$24$ total. **Story #2:** Amir has 24 ounces of juice. He pours equal amounts for each of his 3 friends and then adds 6 more ounces for each.	A. $3(x+6)=24$ B. $6(x+3)=24$

		Story #1	Story #2
2.1	Decide which equation represents each story.		
2.2	What does x represent in each equation?		
2.3	Solve each equation. Draw a tape diagram if it helps you with your thinking.		
2.1	What does each solution tell you about its story?		

desmos

Unit 7.6, Lesson 4: Practice Problems

For each equation, draw a tape diagram and find the solution to the equation.

3.1 $6x + 11 = 21$

3.2 $6(x + 1) = 24$

Explore

Each of the tape diagrams are the same length.
Write an equation for each tape diagram and find the solution to the equation.

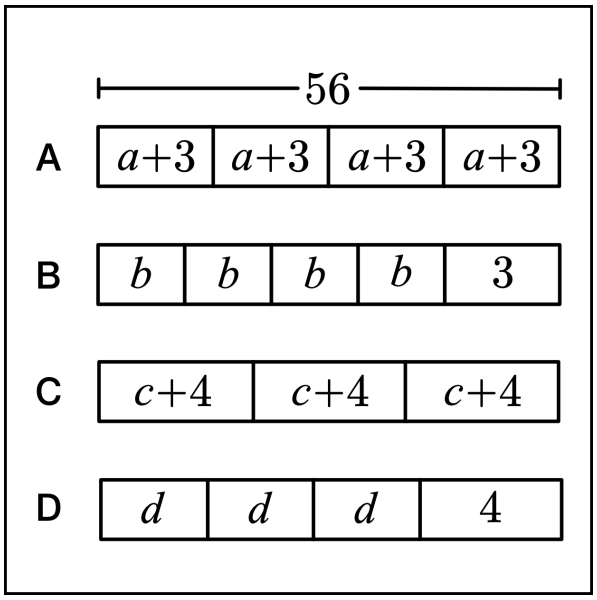


Diagram	Equation	Solution
A		
B		
C		
D		

Reflect

1. Put a smiley face next to the question you spent most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 4: Practice Problems

Answer Key

Warm-Up

$\frac{-8}{15}$, -1 , -2 , $\frac{-3}{10}$

Practice

1. 45 markers

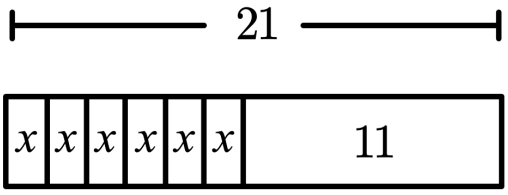
2.1 **Story #1:** B
Story #2: A

2.2 **Story #1:** x represents the cost of a ticket.
Story #2: x represents the number of ounces of juice Amir originally poured for each friend.

2.3 $6(x+3) = 24$, $x = 1$
$3(x+6) = 24$, $x = 2$

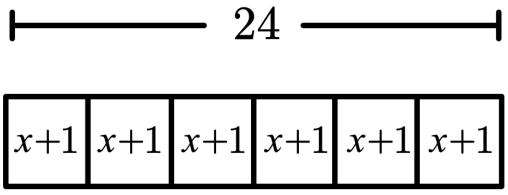
2.4 **Story #1:** Tickets to the show cost $\$1$.
Story #2: Amir originally poured 2 ounces of juice.

3.1



$x = \frac{5}{3}$ (or equivalent)

3.2



$x = 3$ (or equivalent)

Explore

Diagram	Equation	Solution
A	$4(a+3) = 56$	$a = 11$
B	$4b + 3 = 56$	$b = 13.25$
C	$3(c+4) = 56$	$c = \frac{44}{3}$
D	$3d + 4 = 56$	$d = \frac{52}{3}$

desmos

Unit 7.6, Lesson 5: Practice Problems Name _____

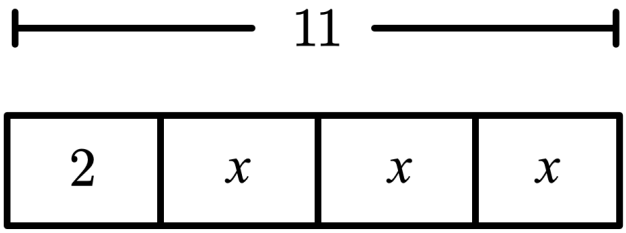
Warm-Up

Select **all** of the expressions equivalent to $2(x+3)$.

- ☐ $2 \cdot (x+3)$
- ☐ $(x+3) \cdot 2$
- ☐ $2 \cdot x + 2 \cdot 3$
- ☐ $2x+3$
- ☐ $(2 \cdot x) + 3$

Practice

1.1 Select **all** of the equations that match the tape diagram.

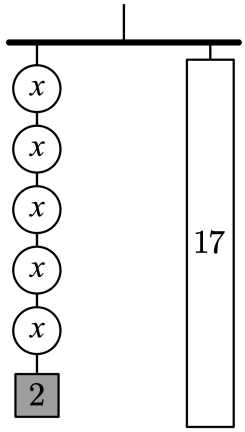


- ☐ $11 = 2 + 3x$
- ☐ $3x + 2x = 11x$
- ☐ $3 + 2x = 11$
- ☐ $11 - 2 = 3x$
- ☐ $11 = 2 + x + x + x$
- ☐ $2x + 3 = 11$

1.2 Draw a tape diagram that matches one of the equations you did not select in Problem 1.1.

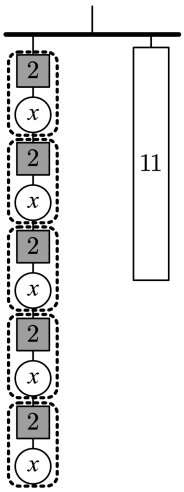
Determine the value of x so that each hanger stays balanced.

2.1



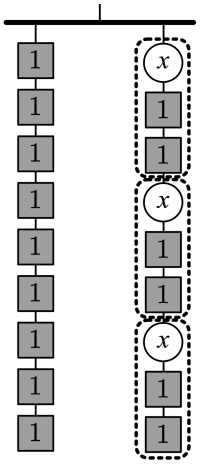
$x =$ _____

2.2



$x =$ _____

2.3



$x =$ _____

desmos

Unit 7.6, Lesson 5: Practice Problems

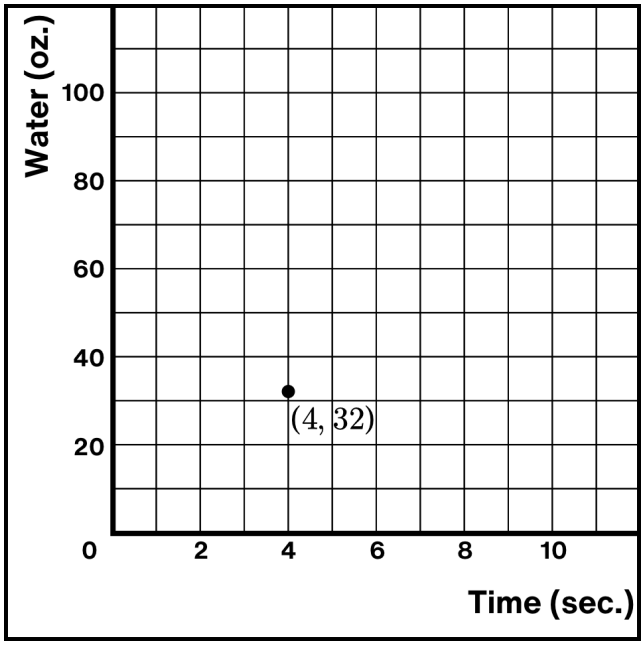
Water runs from a faucet into a bucket at a steady rate. After 4 seconds, there are 32 ounces of water in the bucket.

3.1 What is the constant of proportionality in this relationship?

3.2 What does the constant of proportionality mean in this situation?

3.3 Add at least three more points to the graph and label their coordinates.

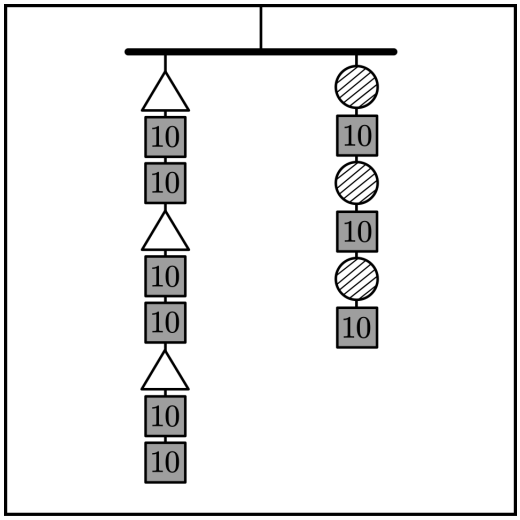
3.4 Write an equation that shows the relationship between time and ounces of water. Use t for time in seconds and w for ounces of water.



Explore

The weight of the square is 10 grams.
How much heavier is the circle than the triangle?

Show or explain your reasoning.



Reflect

1. Put a star next to the question you are most proud of answering.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 5: Practice Problems **Answer Key**

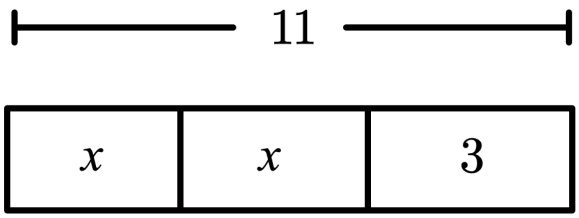
Warm-Up

- ✓ $2 \cdot (x + 3)$
- ✓ $(x + 3) \cdot 2$
- ✓ $2 \cdot x + 2 \cdot 3$

Practice

1.1
- ✓ $11 = 2 + 3x$
- ✓ $11 - 2 = 3x$
- ✓ $11 = 2 + x + x + x$

1.2 *Responses vary*.



2.1 $x = 3$ (or equivalent)

2.2 $x = 0.2$ (or equivalent)

2.3 $x = 1$ (or equivalent)

3.1 8

3.2 8 ounces of water fill the bucket every second.

3.3 *Responses vary*.

$(0, 0)$, $(2, 16)$, $(3, 24)$, $(5, 40)$

3.4 $w = 8t$ (or equivalent)

Explore

The circle is 10 grams heavier that the triangle.

Explanations vary. I crossed off 3 squares on each side and noticed that 3 circles balanced with 3 triangles and 3 squares. I split both sides into three groups to see that 1 circle balanced with 1 triangle and a square. Since squares weigh 10 grams, the circle balances with a triangle plus 10.

desmos

Unit 7.6, Lesson 6: Practice Problems Name _____

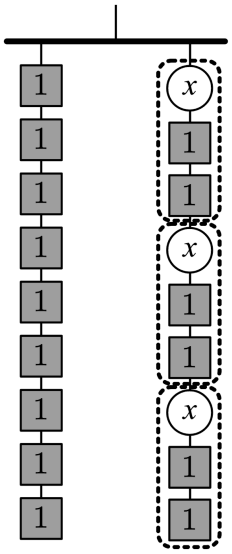
Warm-Up

Mentally determine the value of x that makes each equation true.

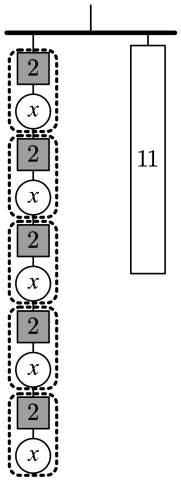
$(x - 1) = 5$ $2(x - 1) = 10$ $3(x - 1) = 15$ $500 = 100(x - 1)$

Practice

1. Explain how each part of $9 = 3(x + 2)$ is represented in the hanger.



2.1 Write an equation that represents this hanger.



2.2 What is the value of x that makes the equation true?

3.1 Draw a hanger that represents the equation $12.7 = 3x + 0.7$.

3.2 What is the value of x that makes the equation true?

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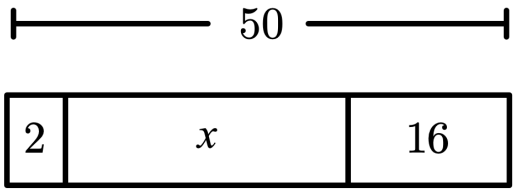
Unit 7.6, Lesson 6: Practice Problems

Hailey drew this diagram to represent the equation $2x + 16 = 50$, but she made a mistake.



4.1 Explain the mistake Hailey made.

4.2 What equation does Hailey's tape diagram represent?

4.3 Make a new diagram that correctly represents the equation.

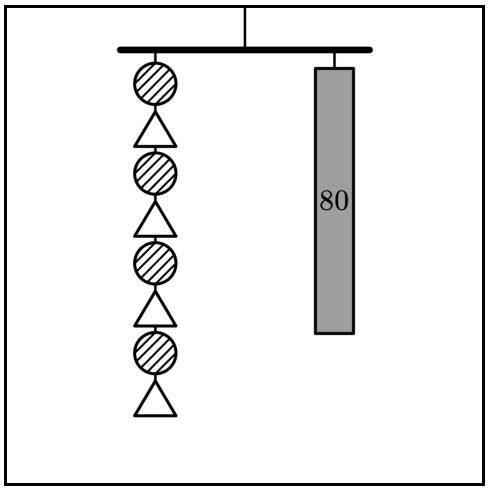
4.4 Use the new diagram to determine the correct value of x.

Explore

The weight of the rectangle is 80 grams.
The weight of the triangle is double the weight of the circle.

Determine the weight of the circle.

Explain or show your reasoning.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 6: Practice Problems **Answer Key**

Warm-Up

$x = 6$ for all equations.

Practice

1. *Responses vary.*

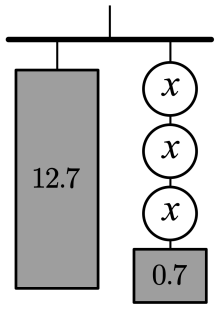
   - The circle has an unknown weight, so we use x to represent it.
   - The 9 in the equation is represented by the left side of the hanger with 9 squares, each weighing 1 unit.
   - There are 3 groups of $x + 2$ on the right side. This represents the $3(x + 2)$ in the equation.
   - The equal sign means that the hanger is balanced.

2.1 *Responses vary.*

- $5(2 + x) = 11$
- $10 + 5x = 11$

2.2 $x = \frac{1}{5}$

3.1

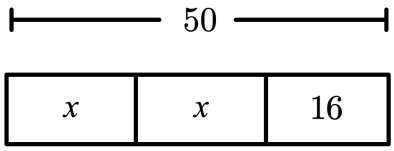


3.2 $x = 4$

4.1 *Responses vary.* Hailey showed $2 + x$ instead of $2 \cdot x$.

4.2 $x + 18 = 50$ (or equivalent)

4.3



4.4 $x = 17$

Explore

$\frac{20}{3}$ grams

Explanations vary. Since the triangles are double the weight of the circles, the left side of the hanger is equivalent to the weight of 12 circles. Dividing the rectangle by 12 calculates the weight of each circle to be $\frac{20}{3}$ grams.

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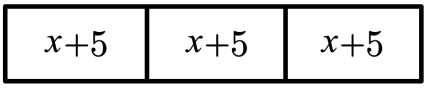
Unit 7.6, Lesson 7: Practice Problems Name _____

Warm-Up

Select **all** of the expressions represented by the tape diagram.



- ☐ $3(x + 5)$
- ☐ $3(x + 15)$
- ☐ $x + x + x + 5 + 5 + 5$
- ☐ $(x + 5) \cdot 3$
- ☐ $15 + 3x$
- ☐ $3x + 5$

Practice

Solve each equation by filling in the blanks.

1.1 $15x - 10 = 65$

$15x =$ ____

$x =$ ____

1.2 $3(x + 7) = -12$

$x + 7 =$ _____

$x =$ _____

1.3 $-100x - 100 = 0$

$-100x =$ _____

$x =$ _____

Solve each equation.

2.1 $-4x = -28$

2.2 $-4(x + 1) = -28$

2.3 $x + 7 = -1$

2.4 $-3x + 7 = -1$

Match each story to an equation.

3.1 A stack of nested paper cups is 8 inches tall. The first cup is 4 inches tall and each of the rest of the cups in the stack adds $\frac{1}{4}$ inch to the height of the stack.

3.2 A baker uses 4 cups of flour. She uses $\frac{1}{4}$ cup to flour the counters and the rest to make 8 muffins.

3.3 Mariana has an 8-foot piece of ribbon. She cuts off a piece that is $\frac{1}{4}$ of a foot long and cuts the remainder into four equal pieces.

A. $\frac{1}{4} + 4x = 8$

B. $4 + \frac{1}{4}x = 8$

C. $8x + \frac{1}{4} = 4$

desmos

Unit 7.6, Lesson 7: Practice Problems

There are 88 seats in a theater. The seating in the theater is split into 4 identical sections. Each section has 14 red seats and some blue seats.

4.1 Draw a tape diagram or hanger to represent the situation.

4.2 Write an equation to represent the situation.

4.3 Describe what x represents in this situation.

Explore

Using the digits 0–9, fill in the blanks so that the values of x are as great as possible. You cannot use the same digit in both equations.

Equation 1

$\square x - \square = \square$

Equation 2

$\square (x - \square) = \square$

Challenge: Can you fill in each blank so that these equations have the same value for x?

Reflect

1. Circle the question you understand best.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 7: Practice Problems

Answer Key

Warm-Up

- ✓ $3(x+5)$
- ☐ $3(x+15)$
- ✓ $x+x+x+5+5+5$
- ✓ $(x+5)\cdot 3$
- ✓ $15+3x$
- ☐ $3x+5$

Practice

1.1 $15x - 10 = 65$

$15x = 75$

$x = 5$

1.2 $3(x+7) = -12$

$x + 7 = -4$

$x = -11$

1.3 $-100x - 100 = 0$

$-100x = 100$

$x = -1$

2.1 $x = 7$

2.2 $x = 6$

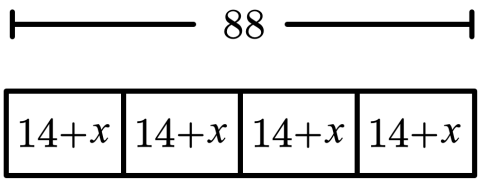
2.3 $x = -8$

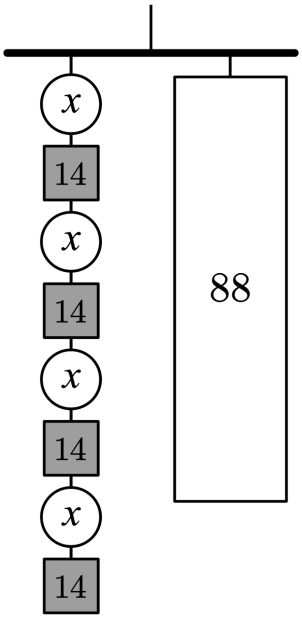
2.4 $x = \frac{8}{3}$

3.1 Equation B

3.2 Equation C

3.3 Equation A





4.1 *Drawings vary.* See examples.

4.2 *Responses vary.* $88 = 4(14 + x)$

4.3 x represents the number of blue seats in each section.

Explore

Responses vary.

Greatest Value

$\boxed{1}\,x - \boxed{9} = \boxed{8}$

$\boxed{2}\,(x - \boxed{7}) = \boxed{6}$

Same Value

$\boxed{1}\,x - \boxed{6} = \boxed{7}$

$\boxed{2}\,(x - \boxed{9}) = \boxed{8}$

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Unit 7.6, Lesson 8: Practice Problems Name _____

Warm-Up

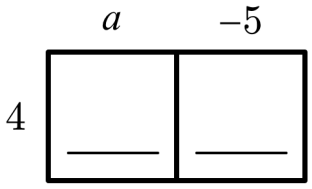
Write each expression in expanded form.

$-2(-6)$ $-2(-y)$ $-2(-6 + -y)$ $-2(-6 - y)$

Practice

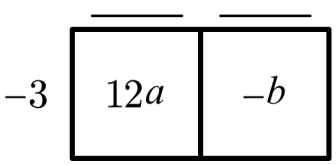
Complete the missing information in each puzzle.

1.1



Factored	Expanded
$4(a + -5)$	_____

1.2



Factored	Expanded
_____	$12a - b$

1.3

Factored	Expanded
_____	$9x - 21$

1.4

Factored	Expanded
$-(3c + 8)$	_____

Solve each equation.

2.1 $2(x - 3) = 14$

2.2 $-5(x - 1) = 40$

2.3 $10x + 2 = 24$

2.4 $\frac{1}{6}(x + 6) = 11$

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Unit 7.6, Lesson 8: Practice Problems

Emmanuel and Mauricio are solving the equation $7(x - 2) = 91$.

3.1 Finish solving each equation.

Emmanuel	Mauricio
$7(x - 2) = 91$	$7(x - 2) = 91$
$7x - 14 = 91$	$x - 2 = 13$

3.2 What is similar and what is different about their strategies?

Use long division to write each fraction as a decimal.

4.1 $\frac{2}{5}$

4.2 $\frac{2}{6}$

4.3 $\frac{2}{11}$

Explore

Using the digits 0–9, fill in the blanks so that the values of x are as great as possible. You cannot use the same digit in both equations.

Equation 1	Equation 2
$\square x - \square = \square$	$\square(x - \square) = \square$

Reflect

1. Put a smiley face on the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 8: Practice Problems

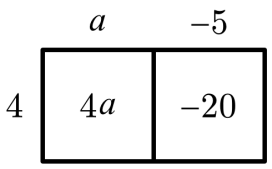
Answer Key

Warm-Up

$12, 2y, 12 + 2y, 12 + 2y$

Practice

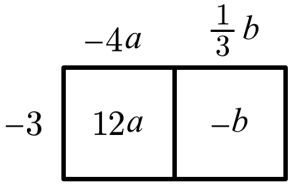
1.1



Expanded

$4a + -20$

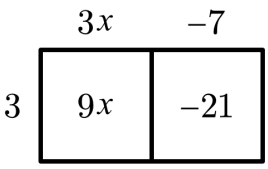
1.2



Factored

$-3(-4a + \frac{1}{3}b)$

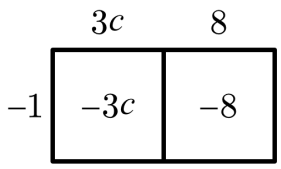
1.3 *Responses vary*.



Factored

$3(3x-7)$

1.4 *Responses vary*.



Expanded

$-3c - 8$

2.1 $x = 10$ 2.2 $x = -7$ 2.3 $x = \frac{22}{10}$ (or equivalent) 2.4 $x = 60$

3.1

Emmanuel	**Mauricio**
$7(x - 2) = 91$	$7(x - 2) = 91$
$7x - 14 = 91$	$x - 2 = 13$
$7x = 105$	$x = 15$
$x = 15$	

3.2 *Responses vary.* These strategies are similar because both involve dividing and adding, but in different orders. These strategies are different because you add a different value to both sides of the equation in order to keep each equation balanced.

4.1 0.4

4.2 $0.3\overline{3}$

4.3 $0.\overline{18}$

Explore

Responses vary.

- $8x - 3 = 4$
- $9(x - 1) = 2$

desmos

Unit 7.6, Lesson 9: Practice Problems Name _____

Warm-Up

Determine the value of each expression.

$-30 \cdot -10$ $-10 + -30$ $-30 - 10$ $10 - (-30)$

Practice

1. Alejandro says that $10x + 6$ and $5x + 11$ are equivalent because they equal 16 when x is 1.

   Do you agree with Alejandro? Explain your reasoning.

2.1 Write at least three different expressions that are equivalent to:

$$16a - 24$$

2.2 Write at least three different expressions that are equivalent to:

$$\frac{-1}{2}(-12x + 30)$$

Write an equivalent expression in expanded form. If you get stuck, consider drawing boxes to help organize your work.

3.1 $8(-x + \frac{1}{4})$

3.2 $-2(-6x - 1)$

3.3 $\frac{1}{5}(20y - 13)$

3.4 $9(4x + 3y + \frac{2}{3})$

desmos

Unit 7.6, Lesson 9: Practice Problems

The output from different power plants in megawatts (MW) are shown in the tables.

Coal Power Plant

Energy (MW)	Number of Days
1 200	2.4
1 800	3.6
4 000	8
10 000	20

Solar Power Plant

Energy (MW)	Number Of Days
100	1
650	4
1 200	7
1 750	10

4.1 For the coal power plant, is the energy output proportional to the number of days? Use E to represent energy and d toe represent the number of days.

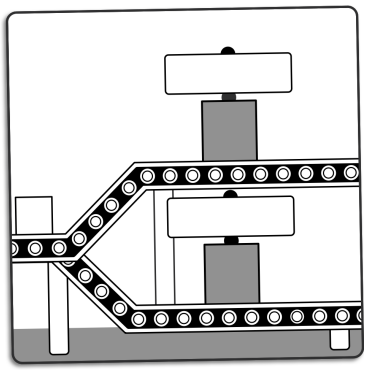
If yes, write an equation showing the relationship. If not, explain your reasoning.

4.2 For the solar power plant, is the energy output proportional to the number of days? Use E to represent energy and d to represent the number of days.

If yes, write an equation showing the relationship. If not, explain your reasoning.

Explore

Here is a never-equal machine. Write two expressions that will never return the same output.



Show or explain how you know your two expressions will never return the same output.

Reflect

1. Put a heart next to the question you found most interesting to complete.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 9: Practice Problems **Answer Key**

Warm-Up

300, -40, -40, 40

Practice

1. No.

   Explanations vary. Equivalent expressions are equal for any value of the variable. When x is 0, these are not equal.

2.1 *Responses vary.*

$-24+16a$, $8(2a-3)$, $-2(-8a+12)$

2.2 *Responses vary.*

$6x-15$, $3(2x-5)$, $6x+-15$

3.1 $-8x+2$

3.2 $12x+2$

3.3 $4y-\frac{13}{5}$

3.4 $36x+27y+6$

4.1 The coal power plant could be a proportional relationship. Its equation would be $E=500d$.

4.2 The solar power plant could not be a proportional relationship since the ratio between the number of days and the energy output is not constant.

Explore

Responses vary.

x and $x+1$ will never return the same output because the second machine's output will always be greater than the first machine's output.

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Unit 7.6, Lesson 10: Practice Problems Name _____

Warm-Up

Select **all** of the expressions that are equivalent to $4x - 5 + 6$.

☐ $4x + (-5) + (6)$ ☐ $4x - 6 + 5$ ☐ $4x + 1$ ☐ $5x$ ☐ $5 + 6 - 4x$

Practice

Solve each equation.

1.1 $5(n-4) = -60$	1.2 $-3t + (-8) = 25$	1.3 $7p-8 = -22$	1.4 $\frac{2}{5}(j + 40) = -4$

Fill in the blanks to make each equation true.

2.1 $6x + \_\_\_\_\_ = 10x$	2.2 $6x + \_\_\_\_\_ = 2x$	2.3 $6x + \_\_\_\_\_ = -10x$	2.4 $6x + \_\_\_\_\_ = 10x + 5$
2.5 $6x - \_\_\_\_\_ = 2x$	2.6 $6x - \_\_\_\_\_ = x$	2.7 $6x + \_\_\_\_\_ = 10$	2.8 $6x - (\_\_\_\_\_) = 4x - 10$

3. A small town had a population of 960 people last year. The population grew to $1\,200$ people this year. By what percentage did the population grow?

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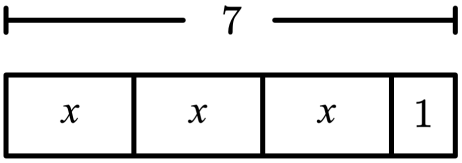
Unit 7.6, Lesson 10: Practice Problems

This diagram can be represented by the equation $7 = 3x + 1$.

4.1 Explain where you can see the 3 in the diagram.



4.2 Determine the value of x.

4.3 Select **all** the stories that could be represented by this equation.

- ☐ Aaliyah is studying 7 hours this week for end-of-year exams. She spends 1 hour on English and an equal number of hours each on math, science, and history.
- ☐ Lan spends $\$3$ on 7 markers and a $\$1$ pen.
- ☐ Sneha shares 7 grapes with 3 friends. She eats 1 and gives each friend the same number of grapes.

Explore

Fill in each blank with a number or expression such that each row and column has the same sum.

	$x+2$	$2-x$
$5-x$	x	
	2	

Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 10: Practice Problems

Answer Key

Warm-Up

✓ $4x + (-5) + (6)$
✓ $4x + 1$

Practice

1.1	$n = -8$	1.2	$t = -11$	1.3	$p = -2$	1.4	$j = -50$
2.1	$4x$	2.2	$-4x$	2.3	$-16x$	2.4	$4x + 5$
2.5	$4x$	2.6	$5x$	2.7	$-6x + 10$	2.8	$(2x + 10)$

3. 25%

4.1 There are 3 parts labeled x.

4.2 $x = 2$

4.3 ✓ Aaliyah is studying 7 hours this week for end-of-year exams. She spends 1 hour on English and an equal number of hours each on math, science, and history.
✓ Sneha shares 7 grapes with 3 friends. She eats 1 and gives each friend the same number of grapes.

Explore

Responses vary.

$2x$	$x+2$	$2-x$
$5-x$	x	$2x-1$
$x-1$	2	$x+3$

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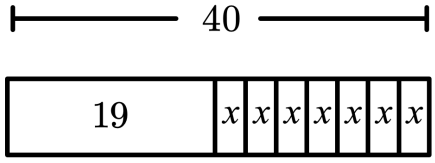
Unit 7.6, Lesson 11: Practice Problems Name _____

Warm-Up

Write three different equations that represent the tape diagram.



1.

2.

3.

Practice

1. Select **all** the statements that are true for any value of x.

   ☐ $7x + (2x + 7) = 9x + 7$

   ☐ $3x + (10 - 3x) = 10$

   ☐ $4x - (2x + 8) = 2x - 8$

   ☐ $7x + (2x - 1) = 9x + 1$

   ☐ $5x - (8 - 6x) = -x - 8$

   ☐ $6x - (2x - 4) = 4x + 4$

Here is Josiah's work writing the expression $2x - \frac{1}{2}(10 - 4x)$ using fewer terms.

Josiah's Strategy

$2x - \frac{1}{2}(10 - 4x)$

$2x + \left(-\frac{1}{2}\right)(10 - 4x)$

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

-5

2.1 Describe the mistake that Josiah made.

2.2 Write an expression equivalent to $2x - \frac{1}{2}(10 - 4x)$ that has two terms.

3. Vicente and Zwena are trying to write $9x - 2x + 4x$ using fewer terms.

   - Vicente says that $9x - 2x + 4x = 3x$ because the subtraction sign tells us to subtract everything that comes after $9x$.
   - Zwena says that $9x - 2x + 4x = 11x$ because the subtraction only applies to $2x$.

   Do you agree with either of them?

   Explain your reasoning.

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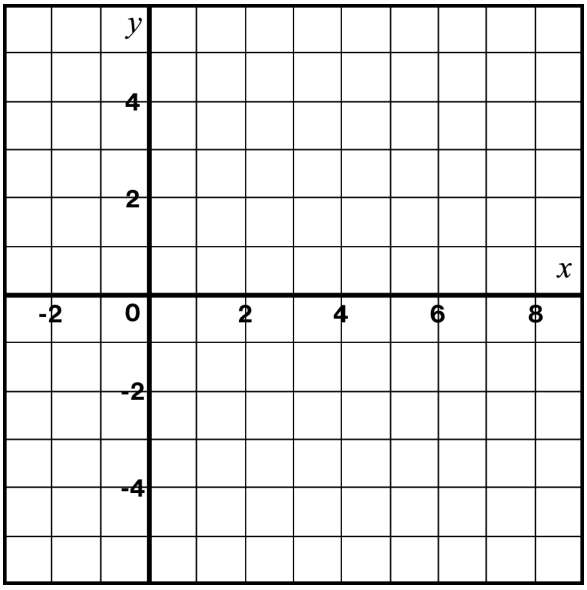
Unit 7.6, Lesson 11: Practice Problems

4.1 Plot these points on the coordinate plane.

$A = (3,\ 2)$
$B = (7.5,\ 2)$
$C = (7.5,\ -2.5)$
$D = (3,\ -2)$



4.2 What is the vertical change from A to D?

4.3 Write an expression that represents the vertical change from C to B.

Explore

Fill in each blank with a number or expression such that each row and column adds up to the same total.

$8-3x$			
$2x-3$	3	$2-x$	x
$1-2x$	$4x-1$	$3x-2$	
	$6-5x$		$6x-7$

Reflect

1. Put a smiley face next to the question you learned from most while you were working on it.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 11: Practice Problems

Answer Key

Warm-Up

Responses vary.

1. $7x + 19 = 40$
2. $19 + x + x + x + x + x + x + x = 40$
3. $7x = 40 - 19$

Practice

1. ✓ $7x + (2x + 7) = 9x + 7$
   ✓ $3x + (10 - 3x) = 10$
   ✓ $4x - (2x + 8) = 2x - 8$
   ✓ $6x - (2x - 4) = 4x + 4$

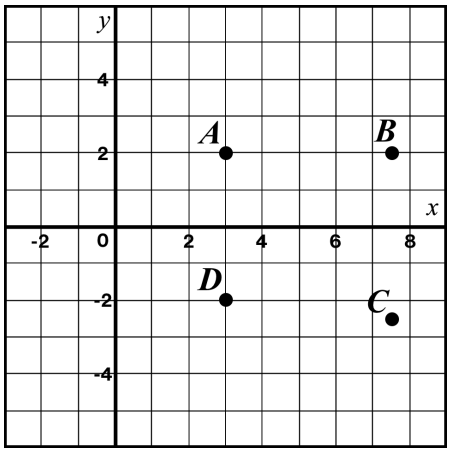
2.1 *Explanations vary.* In the third line, Josiah forgot to distribute the negative to both terms.

2.2 $4x - 5$ (or equivalent)

3. Zwena is correct.

   Explanations vary. Rewriting addition as subtraction gives us $9x + -2x + 4x$, which shows that the subtraction symbol in front of the $2x$ applies only to the $2x$ and not to the terms that come after it.

4.1 See graph.



4.2 The vertical difference between points D and A is -4 units.

4.3 An expression for the vertical distance from C to B is $2 - (-2.5)$.

Explore

Responses vary.

$8-3x$	$3x-6$	$4x-5$	$5-2x$
$2x-3$	3	$2-x$	x
$1-2x$	$4x-1$	$3x-2$	$4-3x$
$5x-4$	$6-5x$	$7-4x$	$6x-7$

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Unit 7.6, Lesson 12: Practice Problems Name _____

Warm-Up

Determine the value of the variable that makes each equation true.

$a \cdot 3 = -30$ $-9 \cdot b = -45$ $-89 \cdot 12 = c$ $d \cdot 88 = -88\,000$

Practice

1.1 Match each equation to the story it describes.

1.2 For each story, answer the question. Explain or show your thinking.

Stories	Equations
A. The temperature outside is currently -7 °C. Since midnight, the temperature tripled and then rose 5 degrees. What was the temperature at midnight?	$5x-7 = 3$
B. Ama has 7 pink roses plus some white roses. She gives all of her roses away by giving 5 roses to each of her 3 favorite teachers. How many white roses does Ama give away?	$7 = 3(5 + x)$
C. A family of 3 goes to a fair. Tickets cost $\$5$ each, but each person has a coupon. They pay $\$7$ altogether. How much money does each person save on buying their ticket?	$3x + 5 = -7$
D. A club puts its members into 5 groups for an activity. 7 students leave early, so there are only 3 students left to finish the activity. How many students were in each group?	$(x + 7) = 3 \cdot 5$

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Unit 7.6, Lesson 12: Practice Problems

2. Six teams are out on the field playing soccer. Each team has the same number of players.

   One of the coaches asks for 2 players from each team to go help move some equipment.

   Now there are 78 players on the field.

   Write and solve an equation whose solution is the number of players on each team.

3. Select **all** of the expressions that show x increased by 35%.

   ☐ $1.35x$ ☐ $\frac{35}{100}\ x$ ☐ $x + \frac{35}{100}\ x$ ☐ $(1 + 0.35)x$ ☐ $(100 + 35)x$ ☐ $\frac{100+35}{100}\ x$

Explore

Consider the expression $(8x - 9 - 12x + 5)$.

1. Change the position of the parentheses to make a new equivalent expression.

   Explain how you know they are equivalent.

2. Change the position of the parentheses to make a new expression that is **not** equivalent to the original. List as many different answers as you can.

Reflect

1. Put a star next to the question you are most proud of on this practice worksheet.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 12: Practice Problems **Answer Key**

Warm-Up

$a = -10$, $b = 5$, $c = -1\,068$, $d = -1\,000$

Practice

1.1 **A:** $3x + 5 = -7$

B: $(x + 7) = 3 \cdot 5$

C: $7 = 3(5 + x)$

D: $5x - 7 = 3$

1.2 **A:** -4 °C

B: 8 white roses

C: The coupon changed the price for each person by $\frac{-8}{3}$ or $-\$2.67$.

D: 2 students in each group

2. **Equation:** $6(x - 2) = 78$ or $6x - 12 = 78$

Solution: $x = 15$

3. ✓ $1.35x$

✓ $x + \frac{35}{100}\ x$

✓ $(1 + 0.35)x$

✓ $\frac{100+35}{100}\ x$

Explore

Responses vary.

1. $(8x - 9 - 12x) + 5$

I know this expression is equivalent because either way we add 5 as the last step.

2. $8x - (9 - 12x + 5)$, $8x - (9 - 12x) + 5$, $8x - 9 - (12x + 5)$

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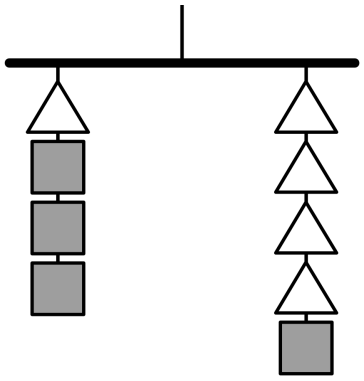
Unit 8.4, Lesson 3: Practice Problems Name _____

1. In this hanger, the weight of the triangle is x and the weight of the square is y. Write an equation using x and y to represent the hanger.



2. Match each set of equations with the move that turned the first equation into the second.

a) Step 1: $6x + 9 = 4x - 3$
   Step 2: $2x + 9 = -3$

b) Step 1: $-4(5x - 7) = -18$
   Step 2: $5x - 7 = 4.5$

c) Step 1: $8 - 10x = 7 + 5x$
   Step 2: $4 - 10x = 3 + 5x$

d) Step 1: $\frac{-5x}{4} = 4$
   Step 2: $5x = -16$

e) Step 1: $12x + 4 = 20x + 24$
   Step 2: $3x + 1 = 5x + 6$

1. Multiply both sides by $\frac{-1}{4}$.
2. Multiply both sides by -4.
3. Multiply both sides by $\frac{1}{4}$.
4. Add $-4x$ to both sides.
5. Add -4 to both sides.

Felipe and Makayla each tried to solve the equation $2x + 6 = 3x - 8$.

3.1 The result of Felipe's first step was $-x + 6 = -8$. Describe the first step Felipe made.

3.2 The result of Makayla's first step was $6 = x - 8$. Describe the first step Makayla made.

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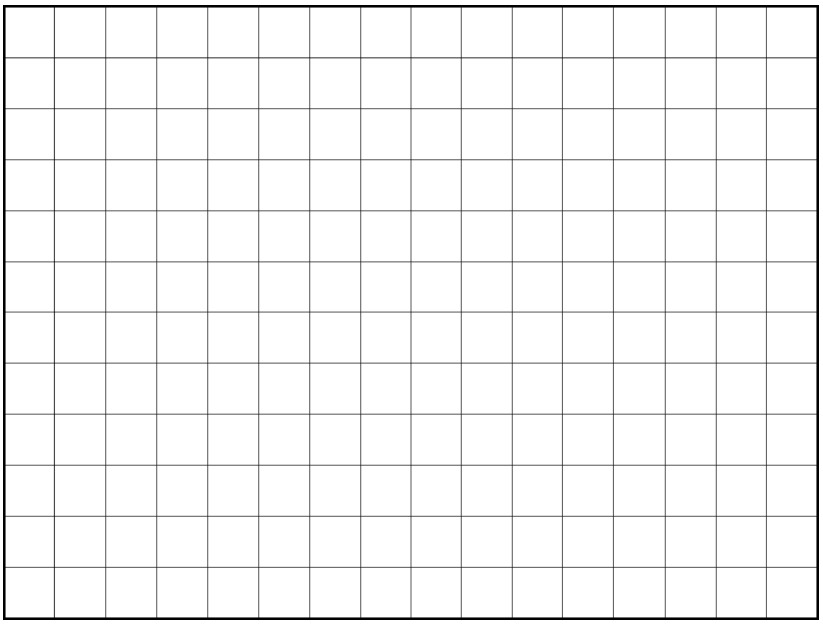
Unit 8.4, Lesson 3: Practice Problems

4.1 Complete the table with values for x and y that make this equation true: $3x + y = 15$.

x	y
2	
	3
6	
0	
3	
	0
	8

4.2 Create a graph and plot the points from the table.



4.3 Find the slope of the line that goes through the points.

5. Select **all** the situations for which only zero or positive solutions make sense.

- ☐ Measuring temperature in degrees Celsius at an Arctic outpost each day in January.
- ☐ The height of a candle as it burns over an hour.
- ☐ The elevation above sea level of a hiker descending into a canyon.
- ☐ The number of students remaining in school after 6:00 p.m.
- ☐ The temperature in degrees Fahrenheit of an oven used on a hot summer day.

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Unit 8.4, Lesson 3: Practice Problems

Answer Key

1.1 $x + 3y = 4x + y$

2.1

a) Step 1: $6x + 9 = 4x - 3$
Step 2: $2x + 9 = -3$

4. Add $-4x$ to both sides.

b) Step 1: $-4(5x - 7) = -18$
Step 2: $5x - 7 = 4.5$

1. Multiply both sides by $\frac{-1}{4}$.

c) Step 1: $8 - 10x = 7 + 5x$
Step 2: $4 - 10x = 3 + 5x$

5. Add -4 to both sides.

d) Step 1: $\frac{-5x}{4} = 4$
Step 2: $5x = -16$

2. Multiply both sides by -4.

e) Step 1: $12x + 4 = 20x + 24$
Step 2: $3x + 1 = 5x + 6$

3. Multiply both sides by $\frac{1}{4}$.

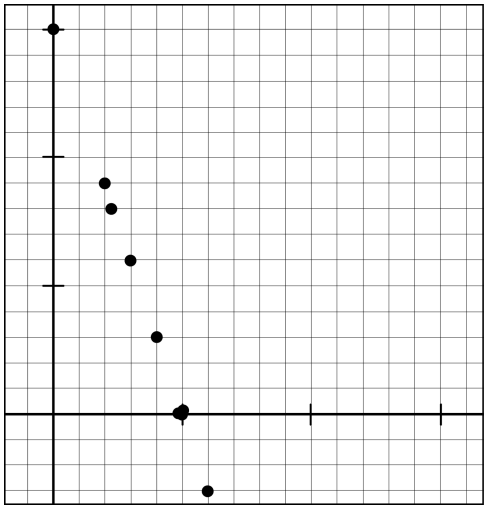
3.1 Felipe subtracted $3x$ from each side.

3.2 Makayla subtracted $2x$ from each side.

4.1 (Unit 3, Lesson 10)

x	y
2	9
4	3
6	-3
0	15
3	6
5	0
$\frac{7}{3}$	8

4.2 (Unit 3, Lesson 10)



4.3 (Unit 3, Lesson 10)
Slope : -3

5. (Unit 3, Lesson 11)

- ✓ The height of a candle as it burns over an hour.
- ✓ The number of students remaining in school after 6:00 p.m.
- ✓ The temperature in degrees Fahrenheit of an oven used on a hot summer day.

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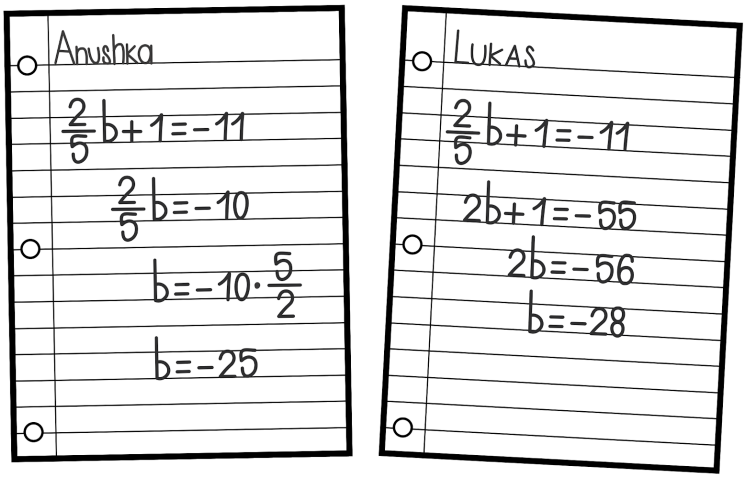
Unit 8.4, Lesson 4: Practice Problems Name _____

1. Anushka and Lukas work on the equation $\frac{2}{5}\ b + 1 = -11$ together. Anushka's solution is $b = -25$ and Luka's is $b = -28$.

   Here is their work.

   Who is correct? Explain your reasoning.



2. Solve the equation $3(x - 4) = 12x$.

3. Describe what is being done in each step while solving the equation.

   Original equation: $2(-3x + 4) = 5x + 2$

   Step 1: _____

   $-6x + 8 = 5x + 2$

   Step 2: _____

   $8 = 11x + 2$

   Step 3: _____

   $6 = 11x$

   Step 4: _____

   $\frac{6}{11} = x$

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Unit 8.4, Lesson 4: Practice Problems

Luis solved an equation, but when he checked his answer, he saw his solution was incorrect. He knows he made a mistake, but he can't find it.

$$\begin{aligned} -2(3x - 5) &= 4(x + 3) + 8 \\ -6x + 10 &= 4x + 12 + 8 \\ -6x + 10 &= 4x + 20 \\ 10 &= -2x + 20 \\ -10 &= -2x \\ 5 &= x \end{aligned}$$

4.1 Circle Luis's mistake.

4.2 What is the correct solution to the equation?

5. Choose the equation that has solutions $(5, 7)$ and $(8, 13)$.

☐ $3x - y = 8$ ☐ $y = x + 2$ ☐ $y - x = 5$ ☐ $y = 2x - 3$

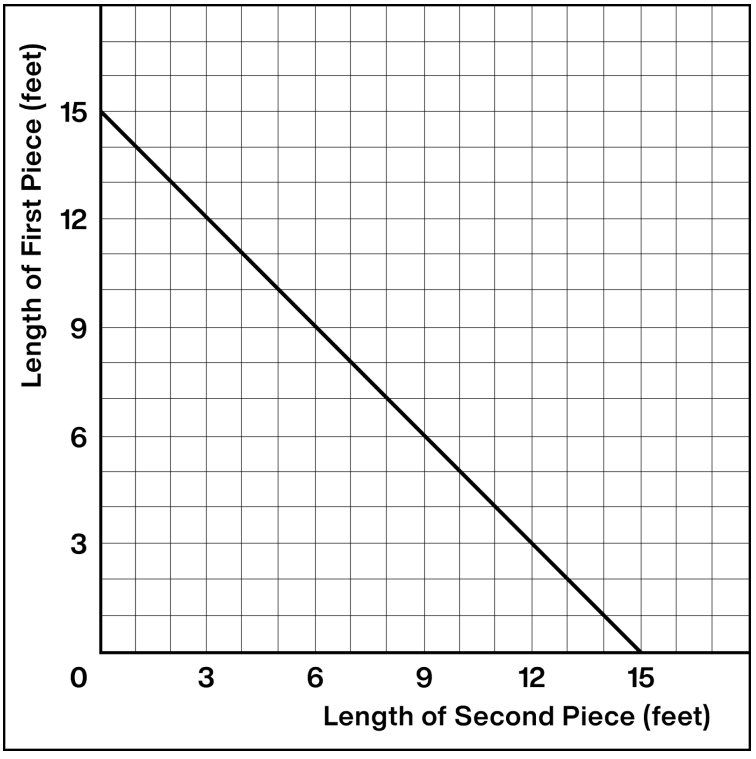
A length of ribbon is cut into two pieces to use in a craft project. The graph shows the length of the second piece, x, for each length of the first piece, y.

6.1 How long is the ribbon?

Explain your reasoning.

6.2 What is the slope of the line?

6.3 What does the slope mean in this scenario?



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Unit 8.4, Lesson 4: Practice Problems

Answer Key

1. Neither. They both have errors in their solutions.

   Explanations vary. Anushka added -1 on the left side and 1 on the right side of the equation. Lukas multiplied both sides of the equation by 5 but forgot to multiply the 1 by 5.

2. $x = -\frac{4}{3}$

3. Step 1: Multiply $(-3x + 4)$ by 2.

   Step 2: Add $6x$ to each side.

   Step 3: Subtract 2 from each side.

   Step 4: Divide both sides by 11.

4. Luis's mistake occurred in the transition from the third line to the fourth line. He added $6x$ on the left side but subtracted $6x$ on the right side. The correct solution is $x = -1$.

5. (Unit 3, Lesson 10)

   $y = 2x - 3$

6.1 (Unit 3, Lesson 7)

   15 feet

   Explanations vary. When the second piece is 0 feet long, the first is 15 feet long, so that is the length of the ribbon.

6.2 (Unit 3, Lesson 8)

   Slope: -1

   Explanations vary. The slope shows the change in length of one piece for every 1-foot increase in length of the other piece. If one piece is 1 foot longer, the other is 1 foot shorter because the total of the two lengths is constant.

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Unit 8.4, Lesson 1: Practice Problems Name _____

1. Clare asks Andre to play the following number puzzle:
   - Pick a number
   - Add 2
   - Multiply by 3
   - Subtract 7
   - Add your original number

   Andre's final result is 27. What number did he start with?

2. In a basketball game:
   - Aki scores twice as many points as Tyani.
   - Tyani scores four points fewer than Nekeisha.
   - Nekeisha scores three times as many points as Mariana.

   If Mariana scores 5 points, how many points did Aki score?

   Explain your reasoning.

3. Select all of the given points in the coordinate plane that lie on the graph of the linear equation $4x - y = 3$.

   ☐ $(-1, -7)$
   ☐ $(0, 3)$
   ☐ $(\frac{3}{4}, 0)$
   ☐ $(1, 1)$
   ☐ $(2, 5)$
   ☐ $(4, -1)$

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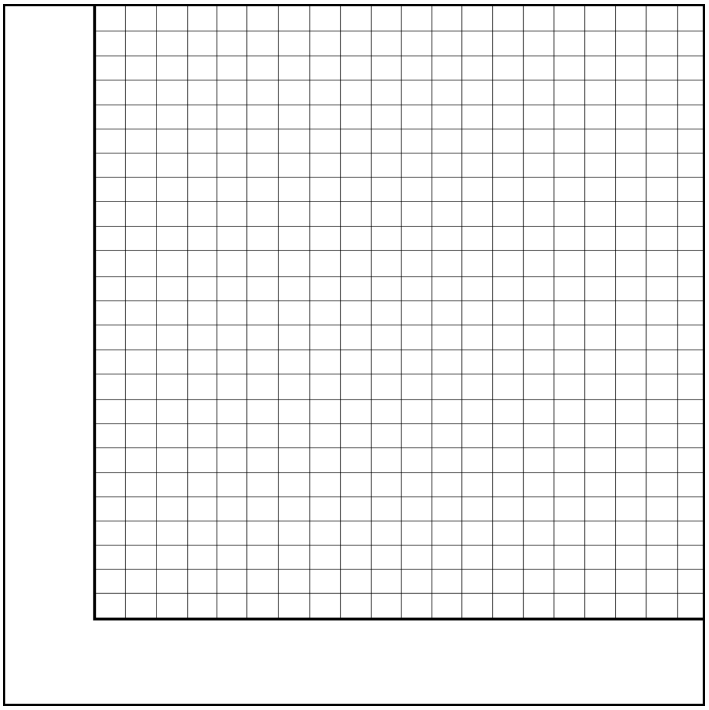
Unit 8.4, Lesson 1: Practice Problems

A store is designing the space for rows of nested shopping carts. Each row has a starting cart that is 4 feet long, followed by the nested carts (so 0 nested carts means there's just the starting cart). The store measured a row of 13 nested carts to be 23.5 feet long and a row of 18 nested carts to be 31 feet long.

4.1 Create a graph of the situation. Label your axes and scales.



4.2 How much does each nested cart add to the length of the row? Explain your reasoning.

4.3 If the store design allows for 43 feet for each row, how many total carts fit in a row?

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Unit 8.4, Lesson 1: Practice Problems

Answer Key

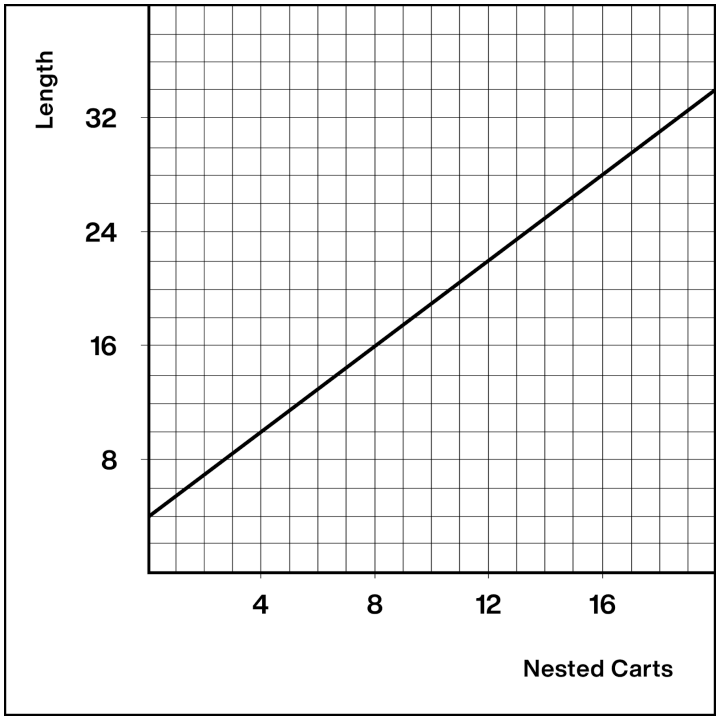
1. David's starting number was 7. $3(x+2)-7+x$ simplifies to $4x-1$. The solution to the equation $4x-1=27$ is $x=7$.

2. 22 points. Nekeisha scores 15 points, which means Tyani scores 11 points, and Aki scores twice as many points as Tyani.

3. (Unit 3, Lesson 10)

   ✓ $(-1, -7)$
   ✓ $(\frac{3}{4}, 0)$
   ✓ $(1, 1)$
   ✓ $(2, 5)$

4.1



4.2 1.5 feet

4.3 26 nested carts (or 27 carts total)

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Unit 8.4, Lesson 6: Practice Problems Name _____

Solve each of these equations. Explain or show your reasoning.

1.1 $2b + 8 - 5b + 3 = 13 + 8b - 5$	1.2 $2x + 7 - 5x + 8 = 3(5 + 6x) - 12x$

Solve each of these equations. Then check your solutions.

2.1 $3(3 - 3x) = 2(x + 3) - 30$	2.2 $\frac{1}{3}(z + 4) - 6 = \frac{2}{3}(5 - z)$

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Unit 8.4, Lesson 6: Practice Problems

3. Irene says the equation $9x + 15 = 3x + 15$ has no solutions because $9x$ is greater than $3x$. Do you agree with Irene? Explain your reasoning.

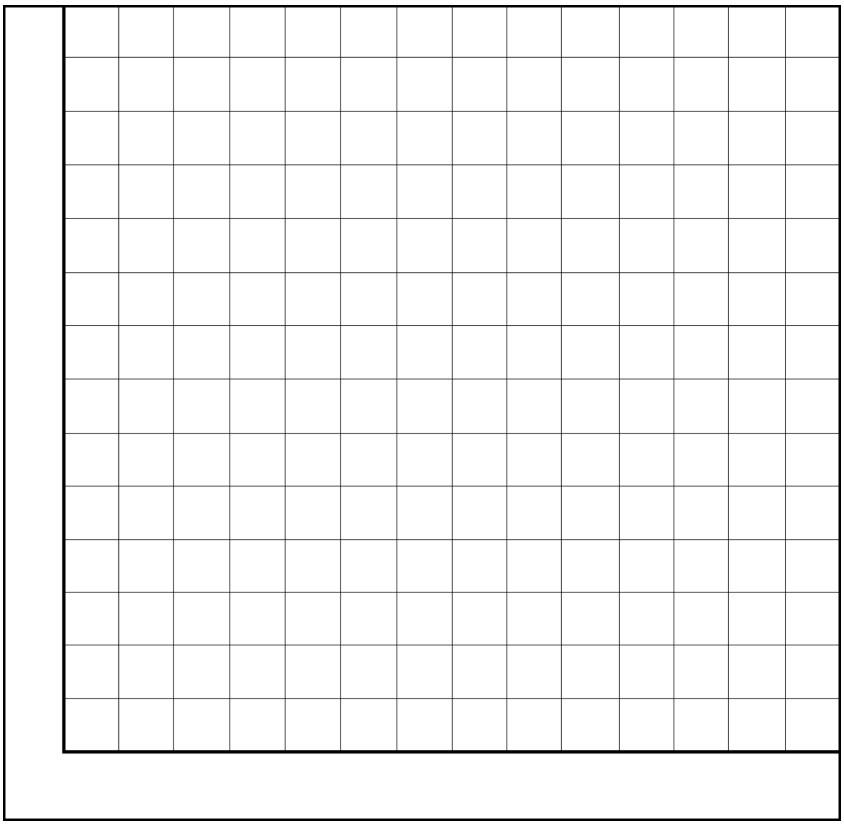
The table gives some sample data for two quantities, x and y, that are in a proportional relationship.

4.1 Complete the table.

x	y
14	21
64	
	39
1	

4.2 Write an equation that represents the relationship between x and y shown in the table.

4.3 Graph the relationship. Use a scale for the axes that shows all the points in the table.



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Unit 8.4, Lesson 6: Practice Problems

Answer Key

1.1 $b = \frac{3}{11}$

1.2 $x = 0$

2.1 $x = 3$

2.2 $z = 8$

3. No.

Responses vary. $9x > 3x$ when $x > 0$, but $9x < 3x$ when $x < 0$, and $9x = 3x$ when $x = 0$. The solution to the equation is $x = 0$.

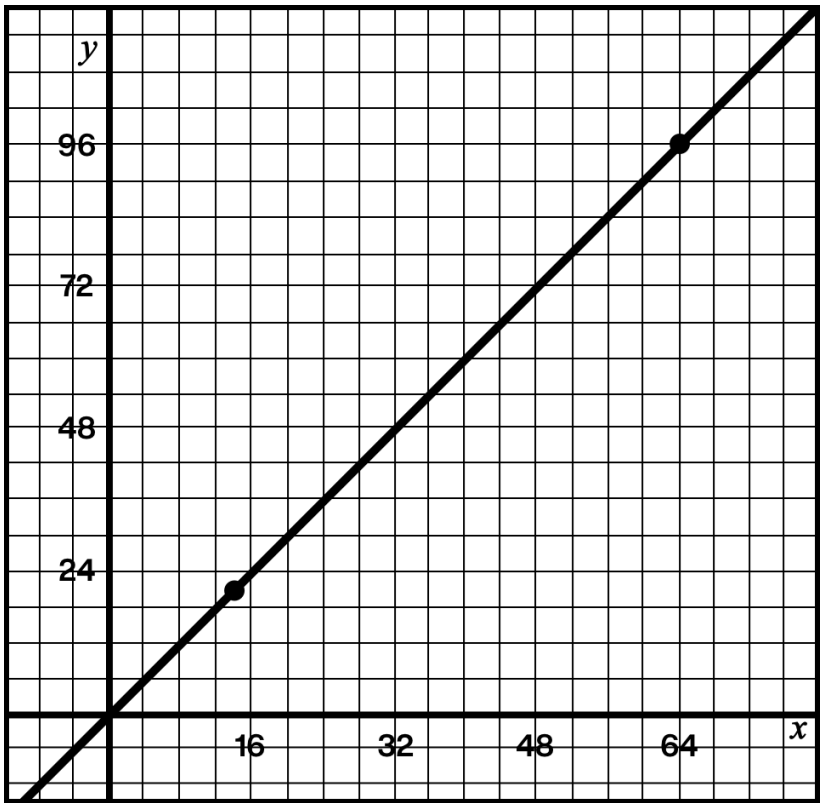
4.1 (Unit 3, Lesson 2)

x	y
14	21
64	96
26	39
1	$\frac{3}{2}$

4.2 (Unit 3, Lesson 2)

$y = \frac{3}{2}\ x$ (or equivalent)

4.3 (Unit 3, Lesson 2)



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Unit 8.4, Lesson 7: Practice Problems Name _____

For each equation, decide if it is always true or never true.

1.1 $x - 13 = x + 1$	1.2 $x + \frac{1}{2} = x - \frac{1}{2}$	1.3 $2(x + 3) = 5x + 6 - 3x$
1.4 $x - 3 = 2x - 3 - x$	1.5 $3(x - 5) = 2(x - 5) + x$	

2. Ivory says that the equation $2x + 2 = x + 1$ has no solution because the left-hand side is double the right-hand side.

   Is Ivory correct? Explain your reasoning.

Write the other side of the equation so that it's true for . . .

3.1 . . . all values of x. $\frac{1}{2}(6x - 10) - x =$	3.2 . . . no values of x. $\frac{1}{2}(6x - 10) - x =$

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Unit 8.4, Lesson 7: Practice Problems

4.

Here is an equation that is true for all values of x: $5(x+2) = 5x + 10$	Anya saw the following equation and said she can tell this is also true for any value of x: $20(x+2) + 31 = 4(5x+10) + 31$
How can she tell? Explain your reasoning.	

5. Daniela is trying to solve an equation for x.

Original equation: $\frac{1}{2}x + 3 = \frac{7}{2}x + 5$	The result of Daniela's first step was: $3 = \frac{7}{2}x - \frac{1}{2}x + 5$
Describe the first step Daniela made for the equation.	

6. Solve this equation. Then check your solution.

$3x - 6 = 4(2 - 3x) - 8x$

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Unit 8.4, Lesson 7: Practice Problems

Answer Key

1.1 Never true
1.2 Never true
1.3 Always true
1.4 Always true
1.5 Never true

2. *Responses vary.*

No. Ivory is correct that $2x + 2 = 2(x + 1)$, so the left-hand side in this equation is double the right-hand side. But $-x$ and -1 can be added to both sides of the equation to get $x + 1 = 0$. So $x = -1$ is a solution. (This works because 0 is its own double, and it is the only number that is its own double.)

3.1 *Responses vary.*

$2x - 5$ (or equivalent)

3.2 *Responses vary.*

$2x + 5$ (or equivalent)

4. *Responses vary.*

You can distribute the left side of the equation and show it is equal to the right side, but it's easier to see that each side of the original equation has been multiplied by 4 and added to 31. These moves keep both sides of the equation in balance, so whatever values of x make the first equation true also make the second equation true.

5. (Unit 4, Lesson 4)

Daniela subtracted $\frac{1}{2}x$ from each side.

6. $x = \frac{14}{23}$

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Unit 8.4, Lesson 8: Practice Problems Name _____

1. For what value of x do the expressions $\frac{2}{3}x + 2$ and $\frac{4}{3}x - 6$ have the same value?

2. Circle the story that matches the equation $-6 + 3x = 2 + 4x$.

Story A

At 5 p.m., the temperatures recorded at two weather stations in Antarctica are -6 degrees and 2 degrees.

The temperature changes at the same constant rate, x degrees per hour, throughout the night at both locations.

The temperature at the first station 3 hours after this recording is the same as the temperature at the second station 4 hours after this recording.

Story B

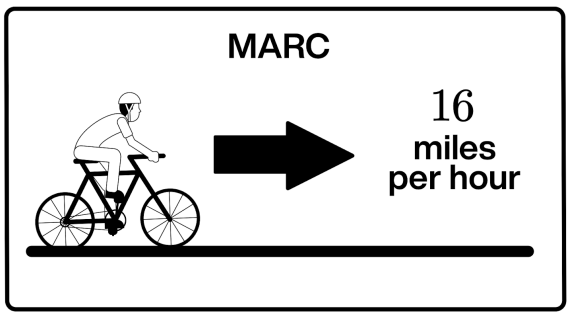
Elena and Kiran play a card game.

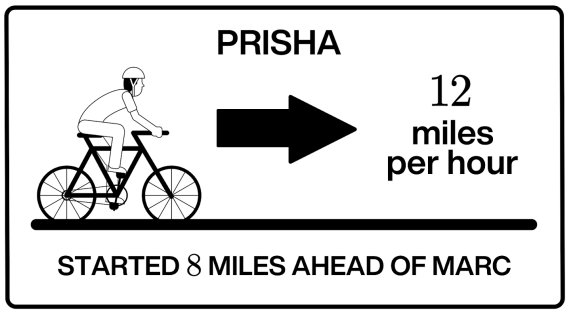
Every time they collect a pair of matching cards, they earn x points.

At one point in the game, Kiran has -6 points and Elena has 2 points.

After Elena collects 3 pairs and Kiran collects 4 pairs, they have the same number of points.

Prisha and Marc are biking in the same direction on the same path.





3.1 Write an expression for the number of miles Marc has gone after t hours.	3.3 Use your expression to find when Marc and Prisha will meet.
3.2 Prisha started riding 8 miles ahead of Marc. Write an expression for the number of miles Prisha has biked.	

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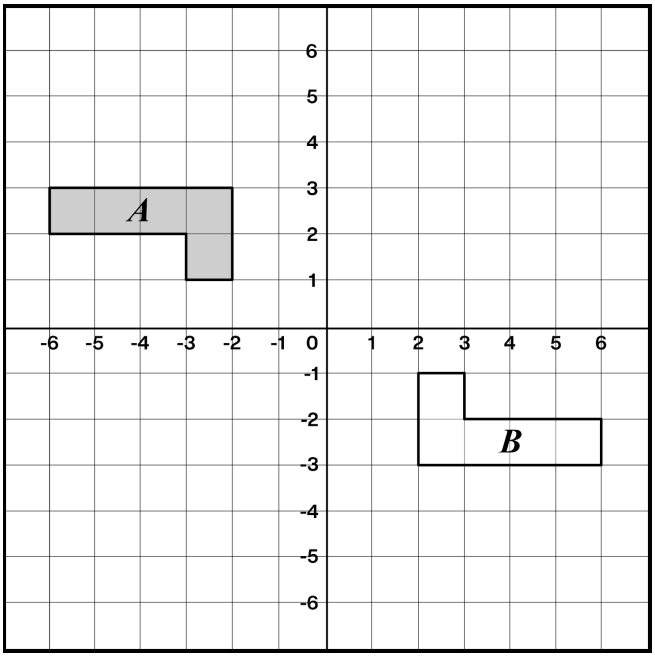
Unit 8.4, Lesson 8: Practice Problems

4. Decide whether each equation is true for all, one, or no values of x .

Equation	True for _____ values of x.
4.1 $2x + 8 = -3.5x + 19$	
4.2 $9(x - 2) = 7x + 5$	
4.3 $3(3x + 2) - 2x = 7x + 6$	

5. Solve this equation: $2k - 3(4 - k) = 3k + 4$.

6. Describe a rigid transformation that takes polygon A to polygon B . Explain your reasoning.



desmos

Unit 8.4, Lesson 8: Practice Problems

Answer Key

1. $x = 12$

2. Story A

3.1 $16t$
3.2 $12t + 8$
3.3 $t = 2$ hours

4.1 True for one value of x.
4.2 True for one value of x.
4.3 True for all values of x.

5. (Unit 4, Lesson 6)

   $k = 8$

   Responses vary. Distribute and combine like terms on the left side, subtract $3k$ on each side, add 12 to each side, and then divide each side by 2.

6. (Unit 1, Lesson 6)

   Responses vary. Rotate polygon A $180°$ around $(0, 0)$.

desmos

Unit 6.7, Lesson 6: Practice Problems Name _____

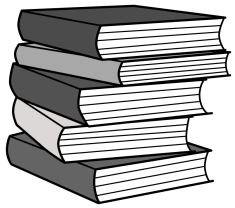
Warm-Up

Complete each number sentence with the symbol $<$, $>$, or $=$.

-12____ $|-15|$ -12____-15 12____-12 $|-12|$____12

Practice

At a book sale, all books cost less than $\$5$.

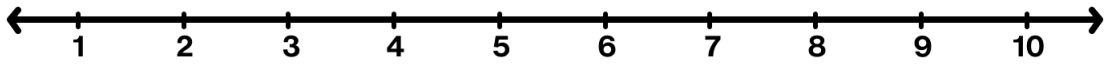


1.1 List three possible prices for a book at this book sale.

_____ _____ _____

1.2 Write an inequality to show the cost of a book, b, at the book sale.

1.3 Make a graph of all the possible prices of books at the sale.



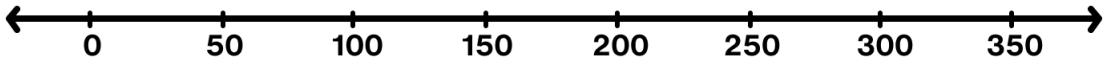
Eva estimated that there are more than 100 candies in the jar.

2.1 List three possible numbers of candies based on Eva's estimate.

_____ _____ _____

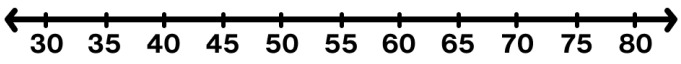
2.2 Write an inequality to show Eva's estimate for c, the number of candies in the jar.

2.3 Make a graph showing Eva's estimate for the number of candies in the jar.

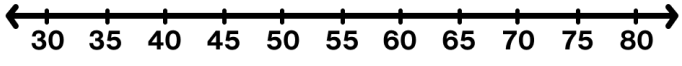


3. One day in Boston, the temperature was above $52°$ and below $60°$. Make two inequalities and two graphs to show the temperatures, T, it could have been on that day.

Inequality: _____



Inequality: _____



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Unit 6.7, Lesson 6: Practice Problems

4.1 Match each statement with a number sentence. There will be one number sentence left over.

_____ -5 is a distance of 5 units away from 0 on the number line.

_____ 4 is greater than -5.

_____ -5 is farther away from 0 than 4 on the number line.

A. $4 > -5$

B. $|-5| = 5$

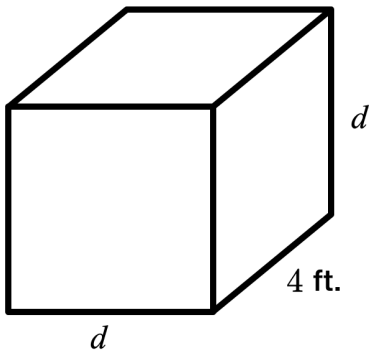
C. $|-5| = |5|$

D. $|-5| > |4|$

4.2 Write a statement to match the leftover number sentence.

Here is a rectangular prism.

5.1 Write an expression for the volume of the prism.



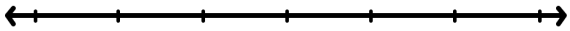
5.2 Calculate the volume of the prism for each value of d.

$d = 2$ ft

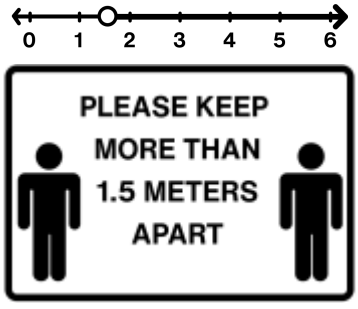
$d = \frac{1}{2}$ ft

Explore

Create your own sign and graph to represent a situation.



Example



Reflect

1. Star the question you spent most time on.
2. Use the space below to ask one question you have or to share something you are proud of

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Unit 6.7, Lesson 6: Practice Problems

Answer Key

Warm-Up

$-12<|-15|$ $-12>-15$ $12>-12$ $|-12|=12$

Practice

1.1 *Responses vary.* $\$1.49$, $\$3$, $\$4.99$

1.2 $b < 5$ or $5 > b$

1.3

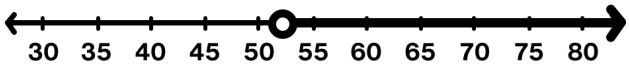
2.1 *Responses vary.* $150, 501, 101$

2.2 $c > 100$ or $100 < c$

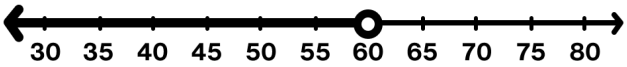
2.3

3.

Inequality: $T > 52$



Inequality: $T < 60$



4.1 B, A, D

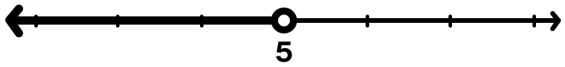
4.2 *Responses vary.* -5 and 5 are the same distance away from 0 on the number line.

5.1 $d \cdot d \cdot 4$ (or equivalent)

5.2 16 cubic feet 1 cubic foot

Explore

Responses vary.



PLAYGROUND FOR CHILDREN UNDER 5

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Unit 6.7, Lesson 7: Practice Problems Name _____

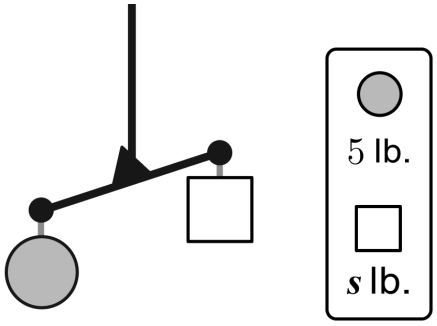
Warm-Up

Complete each number sentence with a number that makes it true.

$-0.3 > \_\_\_\_\_$ $|-0.3| > \_\_\_\_\_$ $|-0.3| < \_\_\_\_\_$ $\_\_\_\_\_ < 0.3$

Practice

Here is an unbalanced hanger.



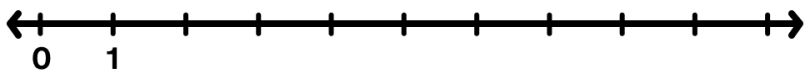
1.1 Which shape is heavier? Explain how you know.

1.2 The circle weighs 5 pounds.
List three possible weights for the square.

_____ _____ _____

1.3 Write an inequality to represent the hanger.

1.4 Graph all the possible weights of the square.



There is leftover food that has been in Jin's refrigerator for d days.

2.1 What does the inequality $d < 7$ tell you about Jin's food?

2.2 What does the inequality $d > 0$ tell you about Jin's food?

2.3 List three possible values of d that make both $d < 7$ and $d > 0$ true.

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Unit 6.7, Lesson 7: Practice Problems

3. Gabriel has an older brother named Alejandro. Gabriel is 12 years old. Select **all** the inequalities that show the relationship between Gabriel's age, g, and Alejandro's age, a.

   ☐ $a < g$ ☐ $g < a$ ☐ $a > g$ ☐ $g > a$ ☐ $a > 12$

Angel's family is driving to their grandmother's house, which is 325 miles away.

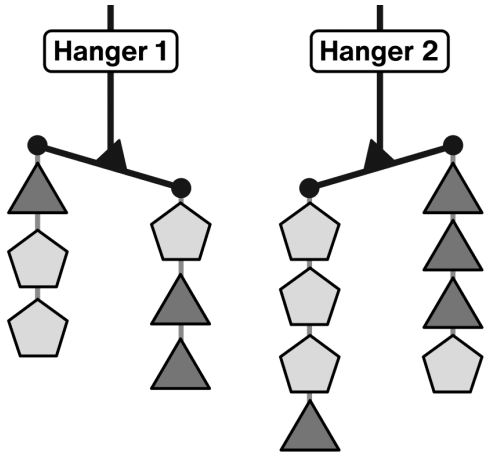
4.1 After they drive 26 miles, what percent of the distance have they travelled?

4.2 How far have they driven if they are 72% of the way to grandma's house?

Explore

Hanger 1 is correct. Is Hanger 2 correct or incorrect?

Explain how you know.



Reflect

1. Mark the question you spent the most time on.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 6.7, Lesson 7: Practice Problems **Answer Key**

Warm-Up

Responses vary.

$-0.3 > -1$ $|-0.3| > 0$ $|-0.3| < 1$ $-1 < 0.3$

Practice

1.1 Circle

Explanations vary. The circle is weighed down, which means that it is heavier than the square.

1.2 *Responses vary.* 4.8, 4, 2.5

1.3 $c > s$ or $5 > s$ (or equivalent)

1.4

2.1 *Responses vary.* It means that all the leftovers are less than 7 days old.

2.2 *Responses vary.* It means that all the leftovers are more than 0 days old.

2.3 *Responses vary.* 0.8, 5, 4.5

3. ✓ $g < a$
   ✓ $a > g$
   ✓ $a > 12$

4.1 8% of the trip

4.2 234 miles

Explore

Incorrect.

Explanations vary. If Hanger 1 is correct, then the triangle has to be heavier than the pentagon. This means that Hanger 2 should also show the right side as heavier than the left.

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Unit 6.7, Lesson 8: Practice Problems Name _____

Warm-Up

Complete each number sentence with the symbol $<$, $>$, or $=$.

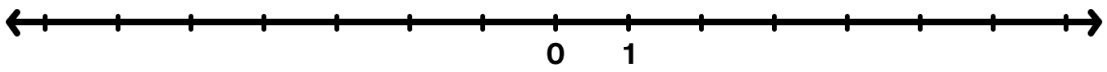
$\left|-\frac{9}{20}\right|$ ____ -0.5 $|-0.5|$ ____ $\frac{9}{20}$ $\left|-\frac{9}{20}\right|$ ____ 0.5 $\left|-\frac{9}{20}\right|$ ____ $|-0.5|$

Practice

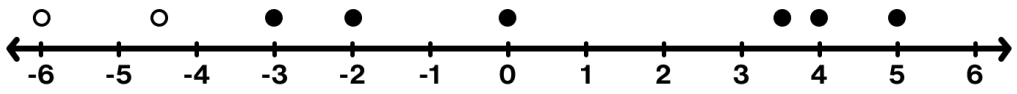
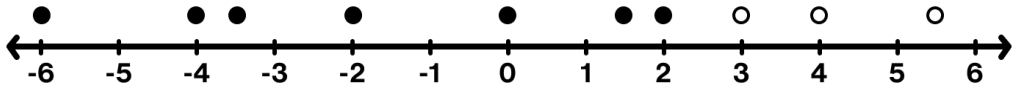
1.1 Select all of the values of k that are solutions to the inequality $k > 5$.

☐ 4.9 ☐ 5 ☐ 6 ☐ 5.2 ☐ -5.01

1.2 Make a graph of all of the solutions to this inequality.



Complete the first three rows with an inequality that fits the given information.
Complete the last row with information that fits the given inequality.

Solutions	Inequality in Symbols
2.1 All of the solid points and none of the open points are solutions. 	
2.2 All of the solid points and none of the open points are solutions. 	
2.3 Solutions: $-\frac{2}{3}$, -1.5, -5 Not solutions: 2, 0, 100	
2.4 Solutions: _____, _____, _____ Not solutions: _____, _____, _____	$x < -2.25$

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Unit 6.7, Lesson 8: Practice Problems

The price of a cell phone is usually $\$250$.

3.1 Manuel's stepmom buys one of these cell phones for $\$150$. What percent of the usual price did she pay?

3.2 Manuel's stepbrother buys the same cell phone for 75% of the usual price. How much did he pay?

3.3 Who got a better deal? Explain your reasoning.

4. Select **all** of the expressions that are equivalent to $\left(\frac{1}{2}\right)^3$.

☐ $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ ☐ $\frac{1}{2^3}$ ☐ $\left(\frac{1}{3}\right)^2$ ☐ $\frac{1}{6}$ ☐ $\frac{1}{8}$

Explore

Fill in the blanks using each number **once**.

$-3, -2, -1, 0, 1, 2, 3$

$x <$ _____ and $x >$ _____

Solutions to **both** inequalities: _____, _____, _____

Not solutions to **both** inequalities: _____, _____

Use the extra space below to record your thinking.

Reflect

1. Put a smiley face on the question that you understood the best.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 6.7, Lesson 8: Practice Problems **Answer Key**

Warm-Up

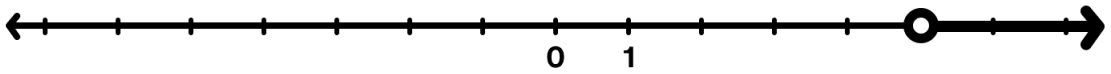
$\left|-\frac{9}{20}\right| > -0.5$ $\quad |-0.5| > \frac{9}{20}$ $\quad \left|-\frac{9}{20}\right| < 0.5$ $\quad \left|-\frac{9}{20}\right| < |-0.5|$

Practice

1.1

☐ 4.9 ☐ 5 ✓ 6 ✓ 5.2 ☐ -5.01

1.2



2.1 *Responses vary.* $x > -4$

2.2 *Responses vary.* $x < 2.5$

2.3 *Responses vary.* $x < -0.5$

2.4 *Responses vary.*

Solutions: $-3, -5.225, -2.3$

Not solutions: $-2, 0, 2.3$

3.1 60%

3.2 $\$187.50$

3.3 Manuel's stepmom.
Explanations vary. She paid $\$37.50$ less than Manuel's stepbrother.

4.

✓ $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ ✓ $\frac{1}{2^3}$ ☐ $\left(\frac{1}{3}\right)^2$ ☐ $\frac{1}{6}$ ✓ $\frac{1}{8}$

Explore

Responses vary. Here are the three correct responses:

$x < 3$	$x < 2$	$x < 1$
$x > -1$	$x > -2$	$x > -3$
Solutions: $0, 1, 2$	Solutions: $-1, 0, 1$	Solution: $0, -1, -2$
Not solutions: $-2, -3$	Not solutions: $-3, 3$	Not solutions: $2, 3$

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Unit 7.6, Lesson 14: Practice Problems Name _____

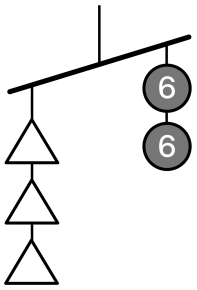
Warm-Up

Select **all** of the values that are solutions to $x \leq -4$.

☐ 4 ☐ -4 ☐ -3.99 ☐ -4.01 ☐ 0

Practice

Here is an unbalanced hanger.



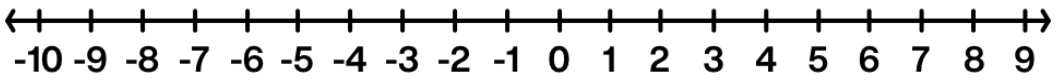
1.1 Write an inequality to represent the relationship of the weights. Use t to represent the weight of the triangle in grams and c to represent the weight of the circle in grams.

1.2 Each circle weighs 6 grams. Write an inequality to represent the weight of one triangle.

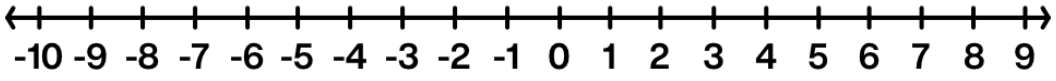
Explain your reasoning.

Draw the solution set of each inequality.

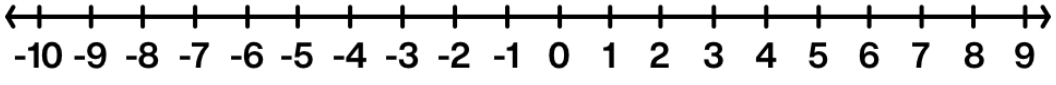
2.1 $5x \leq -20$



2.2 $11 > 2x + 1$



2.3 $2(x + 3) > 18$



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Unit 7.6, Lesson 14: Practice Problems

3.1 List at least three values for x that would make $5x \leq -20$ true.

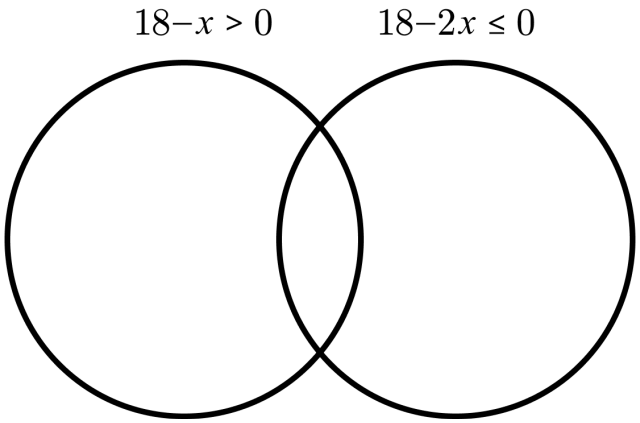
3.2 How are the solutions to the inequality $5x \leq -20$ different from the solutions to $5x < -20$?

4. Finish writing $\frac{5}{8}$ as a decimal.

$$\begin{array}{r} 0.6 \\ 8\overline{)5.00} \\ -48 \\ \hline \end{array}$$

Explore

Write a value in each region that makes the inequality or inequalities true.



Reflect

1. Put a star next to the question that you thought was the most important.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 14: Practice Problems

Answer Key

Warm-Up

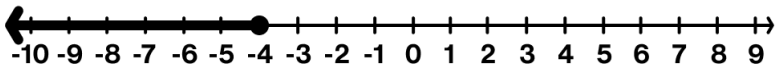
✓ -4 ✓ -4.01

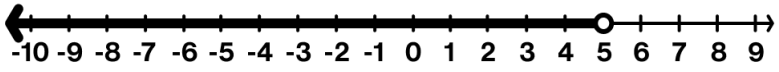
Practice

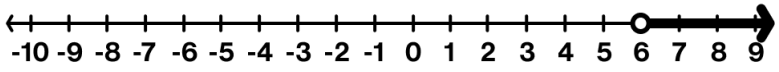
1.1 $3t > 2c$

1.2 $t > 4$

Explanations vary. The right side weighs 12 grams total. Because the left side is heavier, it must weigh more than 12 grams. Since there are three triangles, $12 \div 3 = 4$ grams.

2.1 

2.2 

2.3 

3.1 *Responses vary*. -4, -4.1, -100

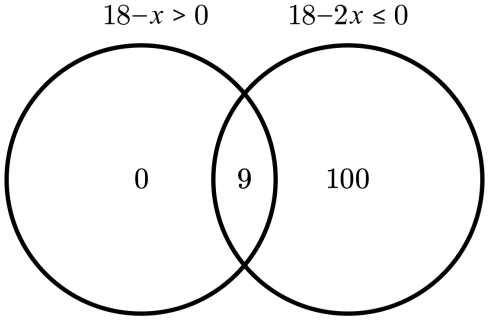
3.2 *Responses vary*. The inequality $5x \leq -20$ includes -4 in its solution and $5x < -20$ does not.

4.

$$
\begin{array}{r}
0.625 \\
8\overline{)5.000} \\
-48 \\
\hline
20 \\
-16 \\
\hline
40 \\
40 \\
\hline
0
\end{array}
$$

Explore

Responses vary.



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Unit 7.6, Lesson 15: Practice Problems Name _____

Warm-Up

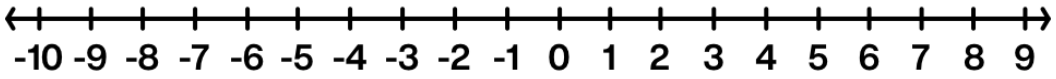
Determine the products.

$\frac{2}{5} \cdot -10$ $\quad -8 \cdot \left(\frac{-3}{2}\right)$ $\quad \left(\frac{10}{6}\right) \cdot 0.6$ $\quad \left(\frac{-100}{37}\right) \cdot (-0.37)$

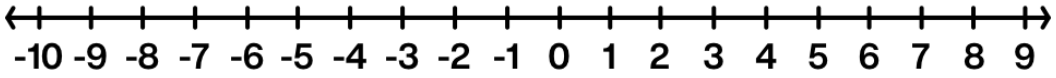
Practice

Draw the solution set of each inequality.

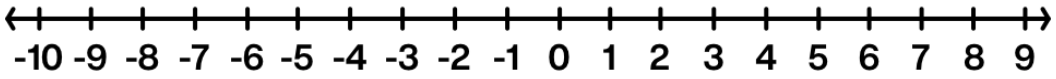
1.1 $x > 7$



1.2 $2x \geq -7$



1.3 $3x + 1 < 4$



Solve the inequality that represents each story. Then interpret what the solution means in the story.

2.1 Alina donates x dollars out of every $\$9$ that she earns. This happens 7 times this month. Alina wants to be sure she keeps at least $\$42$ from this month's earnings.

$7(9 - x) \geq 42$

2.2 Jamir buys a candle that is 9 inches tall and burns down 0.5 inches per minute. He wants to let the candle burn for x minutes until it is less than 6 inches tall.

$9 - 0.5x < 6$

desmos

Unit 7.6, Lesson 15: Practice Problems

Here are some prices customers paid for different items at a farmer's market.
Find the cost for 1 pound of each item.

3.1 $\$5$ for 4 pounds of apples

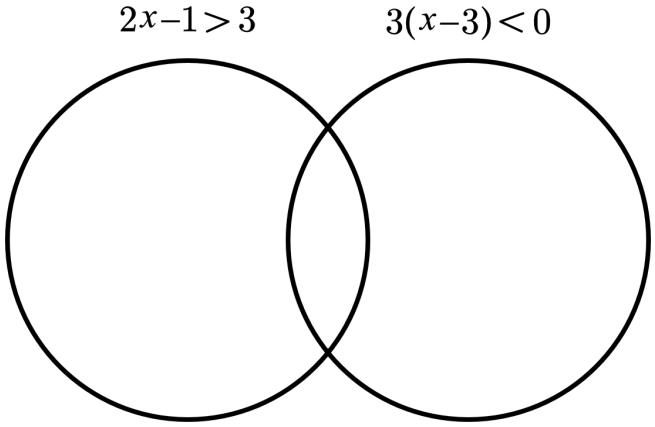
3.2 $\$3.50$ for $\frac{1}{2}$ a pound of cheese

3.3 $\$8.25$ for $1\frac{1}{2}$ pounds of coffee beans

3.4 $\$6.75$ for $\frac{3}{4}$ of a pound of fudge

Explore

Write a value in each region that makes the inequality or inequalities true.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

desmos

Unit 7.6, Lesson 15: Practice Problems

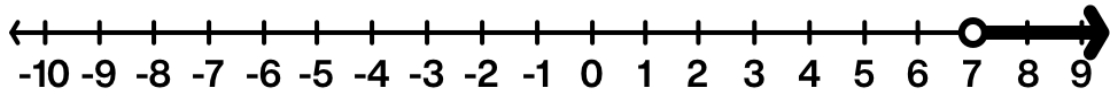
Answer Key

Warm-Up

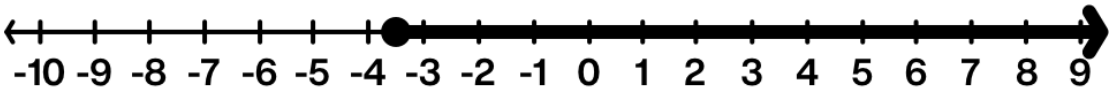
$-4,\ 12,\ 1,\ 1$

Practice

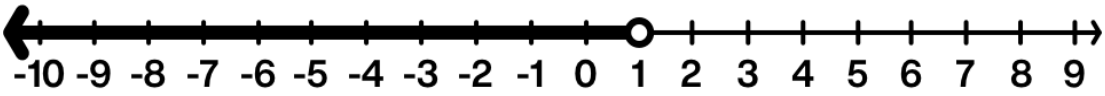
1.1



1.2



1.3



2.1 $x \leq 3$

Alina can donate $\$3$ or less for every $\$9$ she earns.

2.2 $x > 6$

The candle will be less than 6 inches tall when it burns for more than 6 minutes.

3.1 $\$1.25$

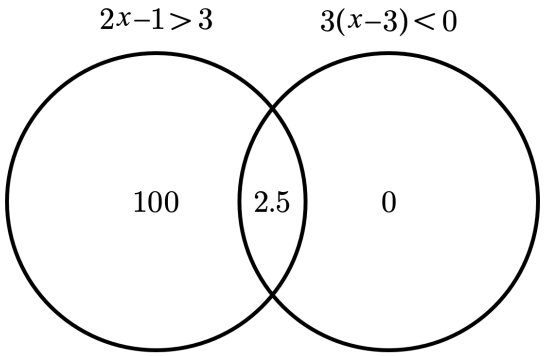
3.2 $\$7$

3.3 $\$5.50$

3.4 $\$9$

Explore

Responses vary.



desmos

Unit 7.6, Lesson 16: Practice Problems Name _____

Warm-Up

Select **all** of the values of x that make the inequality $-x + 6 \geq 10$ true.

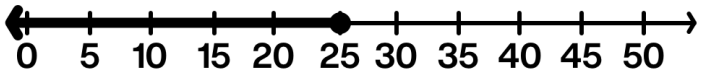
☐ -3.9 ☐ 4 ☐ -4.01 ☐ -4 ☐ 4.01 ☐ 3.9 ☐ 0 ☐ -7

Practice

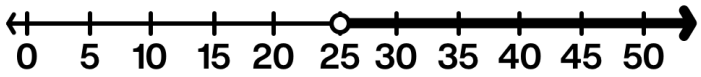
The library is having a party for any student who read at least 25 books over the summer. Determine which inequality describes each situation.

1.1 Ricardo read x books and was invited to the party. $x < 25$

1.2 Prisha read x books over the summer but was not invited to the party. $x > 25$

1.3 

$x \leq 25$

1.4 

$x \geq 25$

2.1 Select **all** of the values of x that make the inequality $100 - 3x \geq -50$ true.

☐ 0 ☐ 50 ☐ -50 ☐ 49.9 ☐ 50.1

2.2 In order to solve the inequality $100 - 3x \geq -50$, Makayla solves the equation $100 - 3x = -50$ and gets $x = 50$. What is the solution to the inequality?

2.3 Explain what the solution to the inequality means.

desmos

Unit 7.6, Lesson 16: Practice Problems

Alma makes 5 cups of her favorite shade of purple paint by mixing 3 cups of blue paint, $1\frac{1}{2}$ cups of red paint, and $\frac{1}{2}$ a cup of white paint.

Alma has 2 cups of white paint.

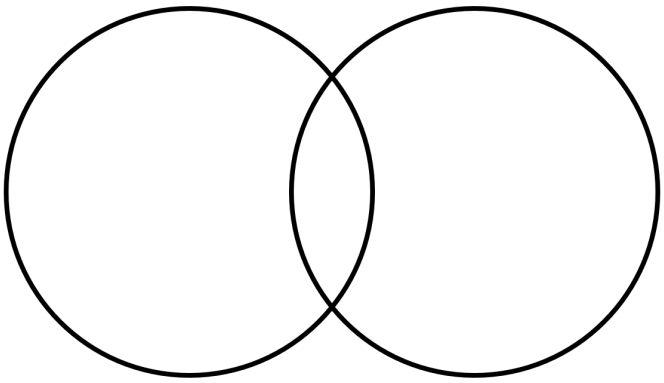
3.1 Assuming she has enough red paint and blue paint, how much purple paint can Alma make?

3.2 How much blue paint and red paint will Alma need to use with the 2 cups of white paint?

Explore

Write a value in each region that makes the inequality or inequalities true.

$5-2x \leqslant -3$ $\quad -3(-5+x) \geqslant 3$



Reflect

1. Circle the question you enjoyed doing the most.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 16: Practice Problems

Answer Key

Warm-Up

✓ -4.01

✓ -4

✓ -7

Practice

1.1 $x \geq 25$

1.2 $x < 25$

1.3 $x \leq 25$

1.4 $x > 25$

2.1 ✓ 0 ✓ 50 ✓ -50 ✓ 49.9

2.2 $x \leq 50$

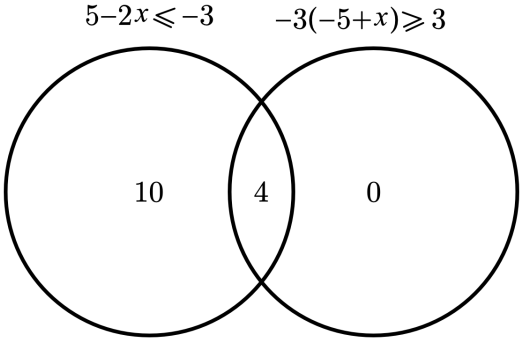
2.3 The inequality $100 - 3x \geq -50$ is true if x is 50 or less.

3.1 She can make 20 cups of purple paint.

3.2 Alma will need 12 cups of blue paint and 6 cups of red paint.

Explore

Responses vary.



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Unit 7.6, Lesson 17: Practice Problems Name _____

Warm-Up

Select **all** of the inequalities that have the same solutions as $-4x < 20$.

☐ $-x < 5$ ☐ $4x > -20$ ☐ $4x < -20$ ☐ $x < -5$ ☐ $x > -5$ ☐ $x > 5$

Practice

When a store sold $\frac{2}{5}$ of the shirts that were on display, they brought out another 30 from the stockroom. The store likes to keep at least 150 shirts on display.

The manager wrote the inequality $\frac{3}{5}x + 30 \geq 150$ to describe the situation.

1.1 Explain what $\frac{3}{5}$ means in the inequality.

1.2 Solve the inequality.

1.3 Explain what the solution to the inequality means in this situation.

Camila has up to $\$100$ to spend on her birthday party at a city swimming pool. There will be 15 friends total. She also plans to spend $\$38.50$ on pizza. How much can she spend per person to go to the pool?

2.1 Write an inequality to represent this situation.

2.2 Solve the inequality you wrote.

2.3 Explain what the solution to the inequality means in this situation.

desmos

Unit 7.6, Lesson 17: Practice Problems

Solve each equation.

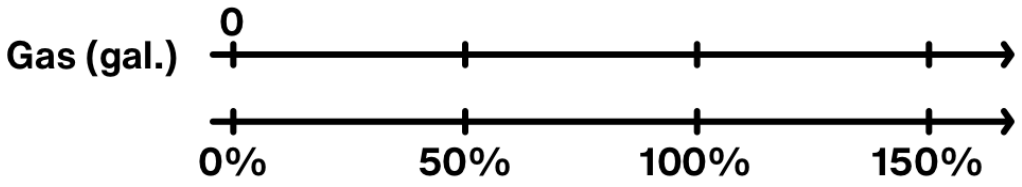
3.1 $-1d-4=-3$

3.2 $-\frac{1}{4}m+5=16$

3.3 $10b+(-45)=-43$

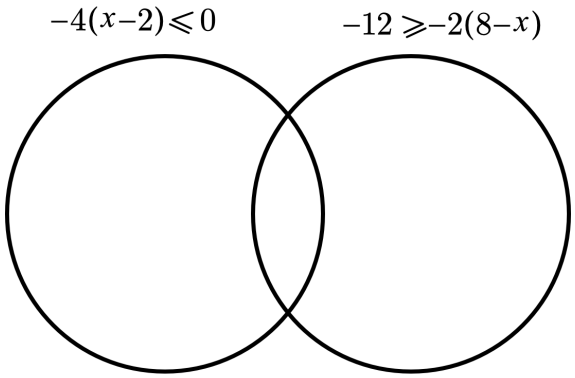
3.4 $-8(y-1.25)=4$

4. The gas tank of a truck holds 30 gallons. The gas tank of a passenger car holds 50% less. How many gallons does it hold?



Explore

Write a value in each region that makes the inequality or inequalities true.



Reflect

1. Circle the question you feel most confident about.
2. Use the space below to ask one question you have or to share something you are proud of.

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Unit 7.6, Lesson 17: Practice Problems **Answer Key**

Warm-Up

✓ $-x < 5$

✓ $4x > -20$

✓ $x > -5$

Practice

1.1 *Explanations vary.* It represents the amount of shirts that remained in the display. After $\frac{2}{5}$ of the shirts were sold, $\frac{3}{5}$ remained.

1.2 $x \geq 200$

1.3 *Explanations vary.* The solution means that the store initially had at least 200 shirts on display.

2.1 $15x + 38.50 \leq 100$

2.2 $x \leq 4.1$

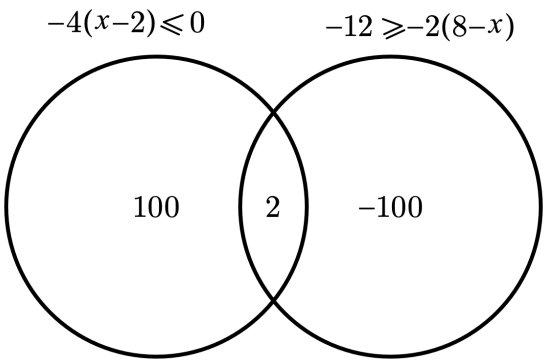
2.3 The solution to the inequality is the most she can spend per person to access the pool.

3.1 $d = -1$ 3.2 $m = -44$ 3.3 $b = \frac{1}{5}$ 3.4 $y = 0.75$

4. 15 gallons because 50% less than 30 is 15.
(If the double number line is used, the tick marks on the top are labeled $0,\ 15,\ 30,\ 45$.)

Explore

Responses vary.



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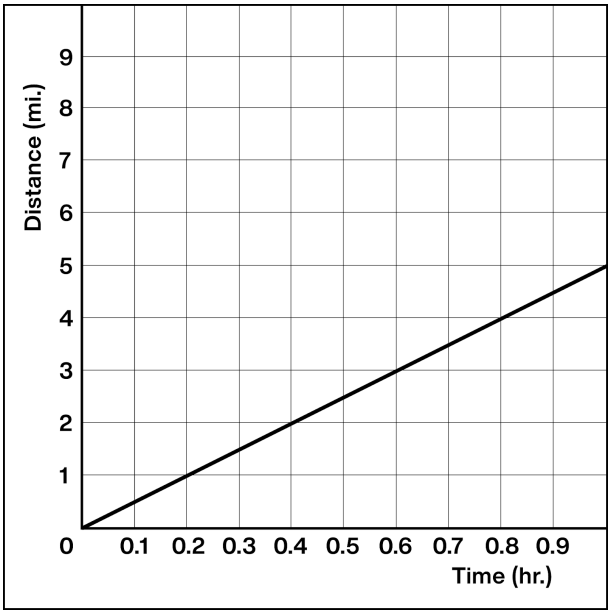
Unit 8.3, Lesson 1: Practice Problems Name _____

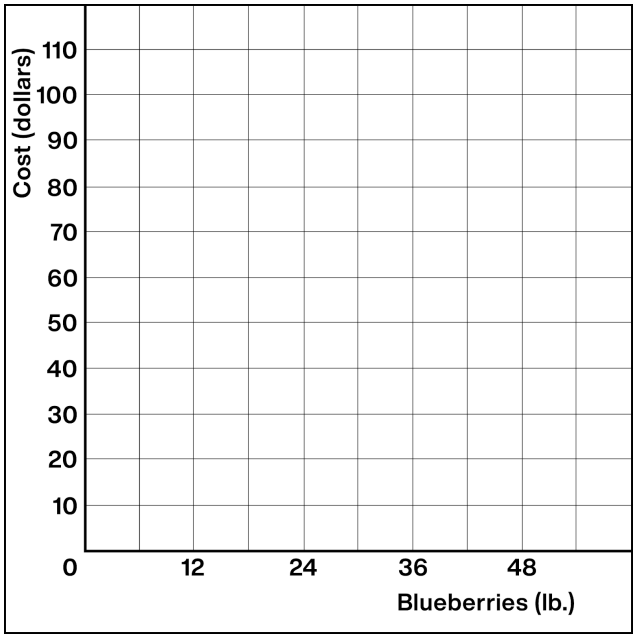
1. Shanice jogs at a constant speed. The relationship between her distance and time is shown on the graph.

   Bao bikes at a constant speed twice as fast as Shanice. On the same axes, sketch a graph showing the relationship between Bao's distance and time.



2. A pick-your-own blueberry farm offers 6 pounds of blueberries for $\$14$.

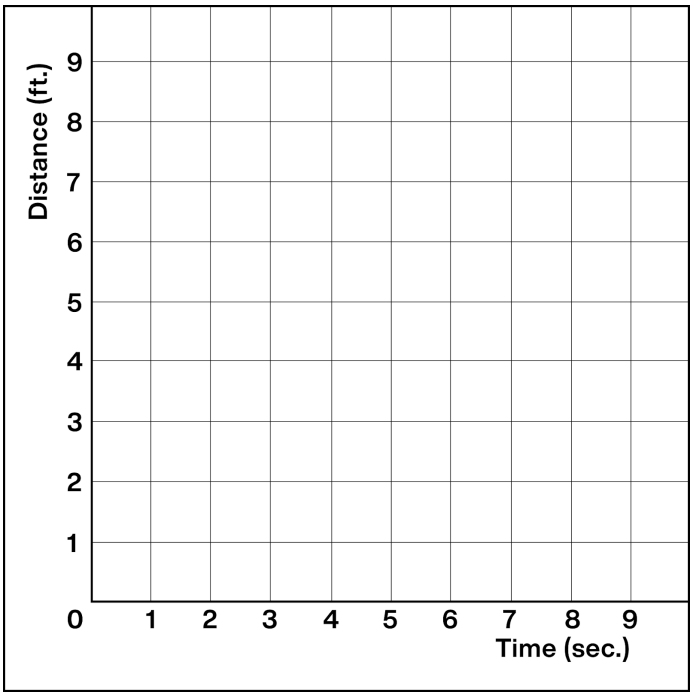
   Sketch a graph of the relationship between cost and pounds of blueberries.



Two people begin walking from the same location. One person walks at a speed of 1 foot per second. The second person walks three times as fast.

3.1 Sketch the relationship between distance and time for each person.

3.2 Explain how you drew the line to represent the faster walker.



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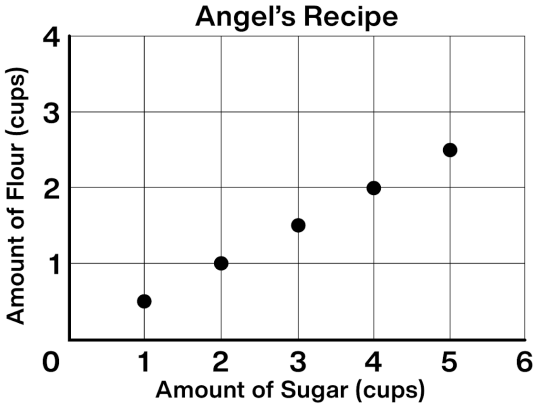
Unit 8.3, Lesson 1: Practice Problems

The graph shows the relationship between the number of cups of flour and the number of cups of sugar in Angel's brownie recipe. The table shows the same relationship for Jaleel's brownie recipe.



Jaleel's Recipe

Amount of Sugar (cups)	Amount of Flour (cups)
$1\frac{1}{2}$	1
3	2
$4\frac{1}{2}$	3

4.1 Jaleel and Angel buy a 12-cup bag of sugar and divide it evenly to make their recipes. If they each use **all** of their sugar, how much **flour** do they each need?

4.2 Jaleel and Angel buy a 20-cup bag of sugar and divide it evenly to make their recipes. If they each use **all** of their sugar, how much **flour** do they each need?

5. Consider the following dialogue:
   - Brianna said, "I found two figures that are congruent, so they can't be similar."
   - Ishaan said, "No, they are similar! The scale factor is 1."

   Who is correct? Explain your thinking.

desmos

Unit 8.3, Lesson 1: Practice Problems

Answer Key

1. Bao's line should pass through $(0, 0)$ and $(0.1, 1)$.

2. The line should pass through $(0, 0)$ and $(6, 14)$.

3.1 One line should pass through the point $(1, 1)$. The second line should pass through the point $(1, 3)$.

3.2 Both relationships are lines pass through $(0, 0)$ because each person began walking from the same location. The two lines also pass through points that represent the distance each person has walked after 1 second. For one line this point is $(1, 1)$ because the person walked 1 foot after 1 second and, for the other line, this point is $(1, 3)$ because they walked 3 feet after 1 second.

4.1 (Unit 3, Lesson 3)

- ✓ **Angela:** 3 cups
- ✓ **Jaleel:** 4 cups

4.2 (Unit 3, Lesson 3)

- ✓ **Angela:** 5 cups
- ✓ **Jaleel:** $6\ \frac{2}{3}$ cups

5. (Unit 2, Lesson 4)

Ishaan

Two figures are congruent if one can be moved to the other using a sequence of rigid transformations, and they are similar if one can be moved to the other using a sequence of rigid transformations and dilations. If two figures are congruent, then they are also similar. Scalings (such as Ishaan's suggested scaling with a scale factor of 1) can also be applied. While scalings are allowed, they're not always required to show that two figures are similar.

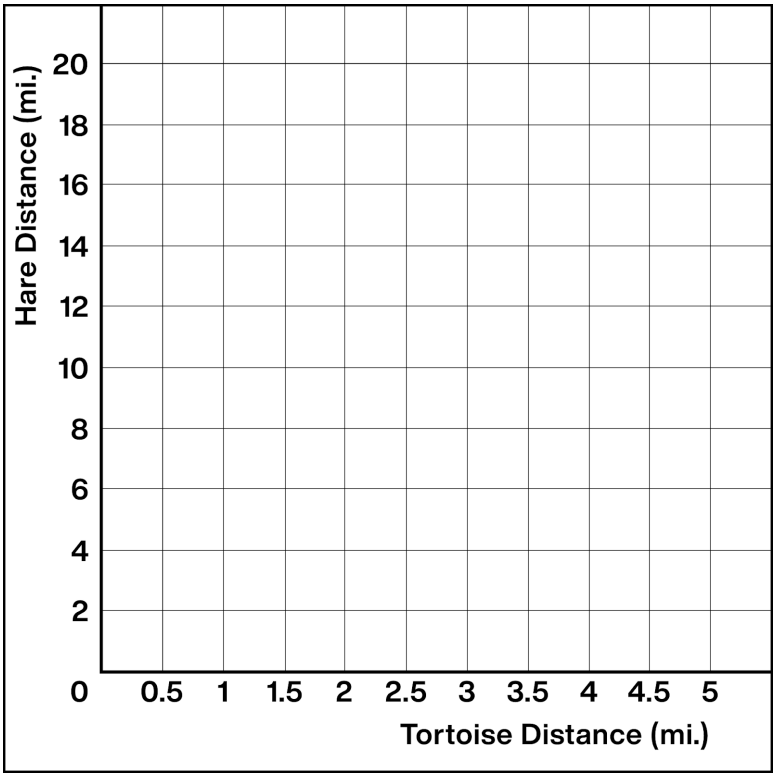
desmos

Unit 8.3, Lesson 2: Practice Problems Name _____

1. The tortoise and the hare are having a race.

   The equation $y = 4x$ represents the relationship between the tortoise's distance, x, and the hare's distance, y. Both distances are measured in miles.

   Sketch a graph showing the relationship between the hare's distance and the tortoise's distance.



The table shows a proportional relationship between the distance walked and the calories burned recorded on a fitness tracker.

2.1 Complete the table.

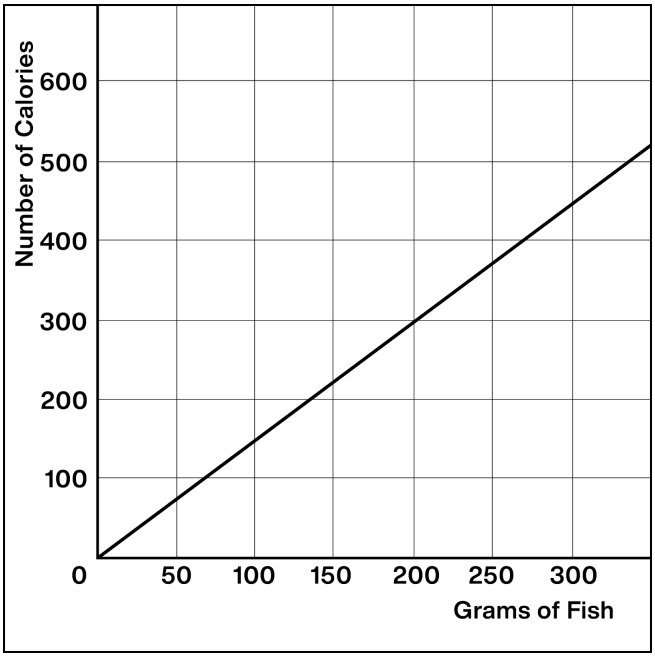
Distance (miles)	Energy (calories)
5	375
12	
	675
1	

2.2 Describe the scales you could use on the x- and y-axes of a coordinate grid that would show all the distances and energies in the table.

desmos

Unit 8.3, Lesson 2: Practice Problems

Here is a graph of the proportional relationship between the amount of fish (in grams) and the number of calories consumed.



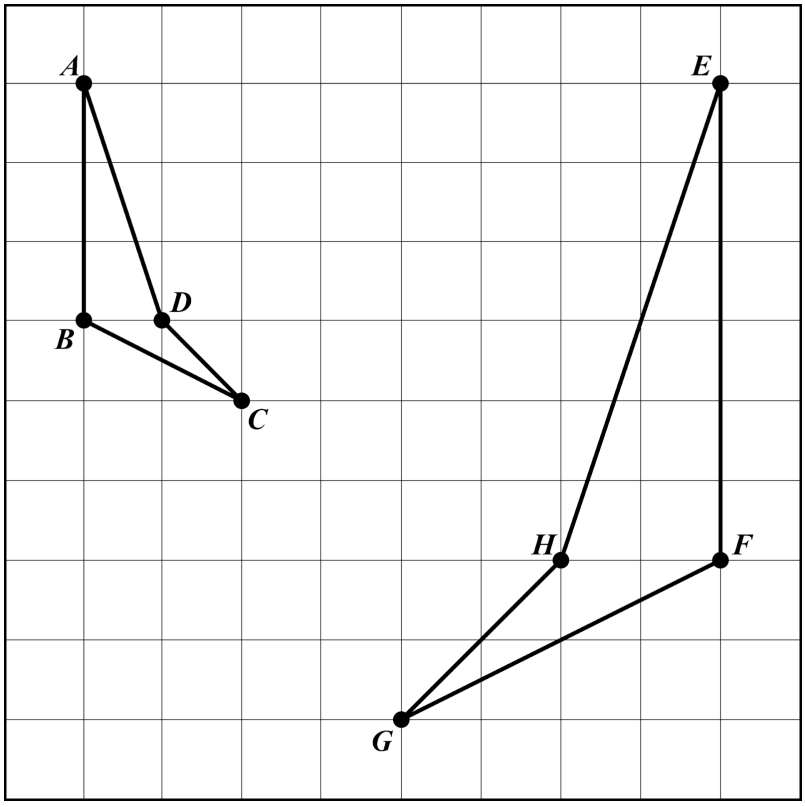
3.1 Create an equation to represent this relationship, where x is the amount of fish in grams and y is the number of calories consumed.

3.2 Use your equation to complete the table.

Grams of Fish	Number of Calories
220	
	1500
1	

4. Describe a sequence of rotations, reflections, translations, and dilations to show that one figure is similar to the other.

Be specific: Give the amount and direction of translation, the line of reflection, the center and angle of rotation, and the center and scale factor of dilation.



desmos

Unit 8.3, Lesson 2: Practice Problems

Answer Key

1. A line though $(0,\ 0)$ and $(2,\ 8)$.

2.1
- ✓ $(5,\ 375)$
- ✓ $(12,\ 900)$
- ✓ $(9,\ 675)$
- ✓ $(1,\ 75)$

2.2 *Responses vary.* From 0 to 12 on the horizontal (distance) axis and from 0 to 900 on the vertical (energy) axis.

3.1 ✓ $y = \frac{3}{2}x$

3.2
- ✓ $(220,\ 330)$
- ✓ $(1000, 1500)$
- ✓ $(1, \frac{3}{2})$

4. (Unit 2, Lesson 6)

Responses vary. Begin with figure $EFGH$. Translate H to D, reflect across a vertical line through D, and then dilate using a scale factor of $\frac{1}{2}$ centered at D.

desmos

Unit 8.3, Lesson 3: Practice Problems Name _____

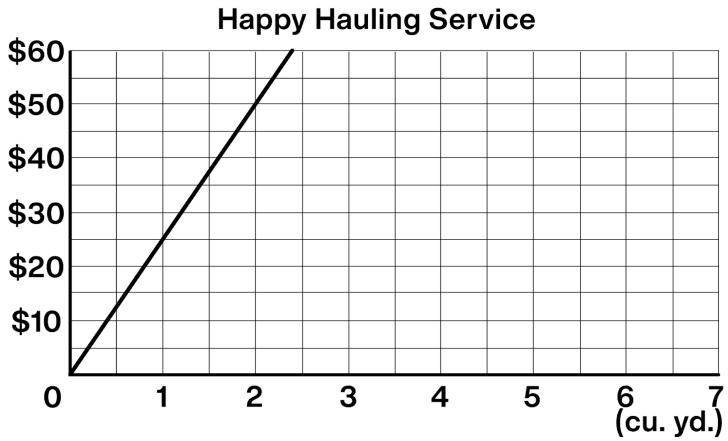
1. Javier and Ebony track the number of steps they walk. Javier records a walk of $6,000$ steps in 50 minutes. Ebony describes her step rate with the equation $y = 118x$, where y is the number of steps and x is the number of minutes she walks.

   This week, Javier and Ebony each walk a total of 5 hours. Who walks more steps?

   How many more steps do they walk?

A contractor must haul a large amount of dirt to a work site. She collected cost information from two companies.

2.1 Calculate the rate of change for Happy Hauling Service.



2.2 Calculate the rate of change for EZ Excavation.

EZ Excavation

Dirt (cu. yd.)	Cost (dollars)
8	196
20	490
26	637

2.3 If the contractor has 40 cubic yards of dirt to haul and only cares about price, which hauling company should she hire? Explain your thinking.

desmos

Unit 8.3, Lesson 3: Practice Problems

Students are selling raffle tickets for a school fundraiser. They collect $\$24$ for every 10 raffle tickets they sell. Suppose M is the amount of money the students collect for selling R raffle tickets.

3.1 Complete the table below.

Tickets Sold, R	**Money Collected, M (dollars)**
10	
20	
300	
...	...
1000	

3.2 Describe the scales you could use on the x- and y-axis of a coordinate grid that would show all the tickets sold and the money collected in the table.

3.3 Write an equation that reflects the relationship between M and R.

desmos

Unit 8.3, Lesson 3: Practice Problems

Answer Key

1. Javier walks 600 more steps than Ebony.

2.1 **Happy Hauling Service:** $\$25$ per cubic yard

Responses vary. The rate of change means it costs $\$25$ to haul 1 cubic yard of dirt.

2.2 **EZ Excavation:** $\$24.50$ per cubic yard

Responses vary. The rate of change means it costs $\$24.50$ to haul 1 cubic yard of dirt.

2.3 EZ Excavation. It would cost $\$980$, which is less than the cost of Happy Hauling Service ($\$1000$).

3.1
- ✓ $\$24$
- ✓ $\$48$
- ✓ $\$720$
- ✓ $\$2400$

3.2 *Responses vary.* From 0 to $1\,000$ on the horizontal (tickets sold) axis and from 0 to $2\,400$ on the vertical (money collected) axis.

3.3 $M = \frac{12}{5}\ R$

desmos

Unit 8.3, Lesson 4: Practice Problems Name _____

1. A restaurant offers delivery for their pizzas and includes the delivery fee in the total price of the pizzas. One customer pays $\$25$ to have 2 pizzas delivered. Another customer pays $\$58$ for 5 pizzas.

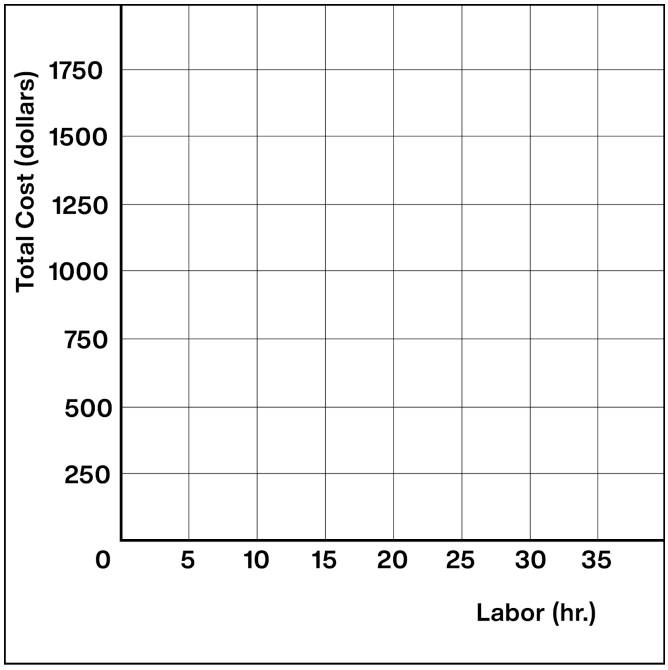
   How many pizzas are delivered to a customer who pays $\$80$?

To paint a house, a painting company charges a flat rate of $\$500$ for supplies plus $\$50$ for each hour of labor.

2.1 How much would the painting company charge to paint a house that needs 20 hours of labor? 50 hours of labor? Write your answers in the table.

Labor (hours)	Cost (dollars)
20	
50	

2.2 Sketch a line representing the relationship between the number of hours of labor needed to paint the house and the total cost of paint.



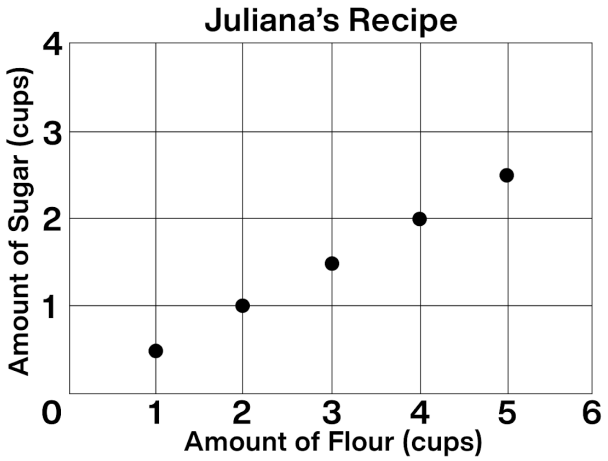
desmos

Unit 8.3, Lesson 4: Practice Problems

2.3 Plot a point to show the cost of 20 hours of labor.

2.4 What is the slope of the line?

The graph shows the relationship between the number of cups of flour and the number of cups of sugar in Juliana's brownie recipe. The table shows the same relationship for Emiliano's recipe.



Emiliano's Recipe

Amount of Flour (cups)	Amount of Sugar (cups)
$1\frac{1}{2}$	1
3	2
$4\frac{1}{2}$	3

3.1 If you have 6 cups of flour for each recipe, how much sugar would you need to make Juliana's and Emiliano's brownies?

Write your answers in the table.

Recipe	Amount of Sugar (cups)
Juliana	
Emiliano	

3.2 What are the slopes of the lines representing Juliana's and Emiliano's recipes? Let x represent the number of cups of flour and y represent the number of cups of sugar.

Write your answers in the table.

Recipe	Slope
Juliana	
Emiliano	

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Unit 8.3, Lesson 4: Practice Problems

Answer Key

1. 7 pizzas

2.1
- ✓ 20 hours: $\$1500$
- ✓ 50 hours: $\$3000$

2.2 A line with y-intercept 500 passing through the point $(10, 1000)$.

2.3 Point at $(20,\ 1500)$

2.4 The slope of the line is 50 dollars per hour. The slope is the same as the price per hour that the painting company charges for labor, in dollars.

3.1
- ✓ Juliana: 3 cups
- ✓ Emiliano: 4 cups

3.2
- ✓ Juliana: $\frac{1}{2}$
- ✓ Emiliano: $\frac{2}{3}$

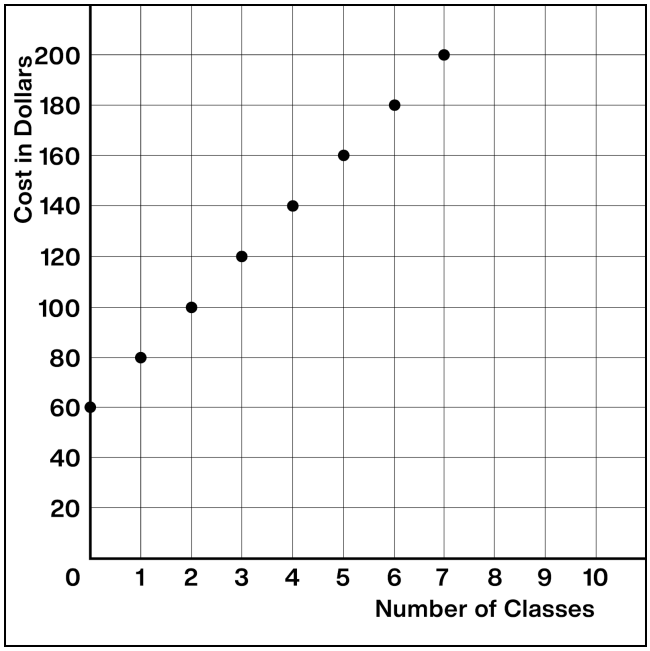
desmos

Unit 8.3, Lesson 5: Practice Problems Name _____

Customers at a gym pay a membership fee to join and then a fee for each class they attend. Here is a graph that represents the scenario.

1.1 What is the slope of the line?

1.2 Write the equation of the line that passes through these points.



Explain what the slope and y-intercept mean in each situation.

2.1 Amara is graphing the relationship between the amount of money, y, in a cash box after x tickets are purchased for carnival games. The slope of the line is $\frac{1}{4}$ and the y-intercept is 8.

- The slope means . . .
- The y-intercept means . . .

2.2 Kayleen is graphing the relationship between the cost in dollars of a muffin delivery, y, and the number of muffins ordered, x. The slope of the line is 2 and the y-intercept is 3.

- The slope means . . .
- The y-intercept means . . .

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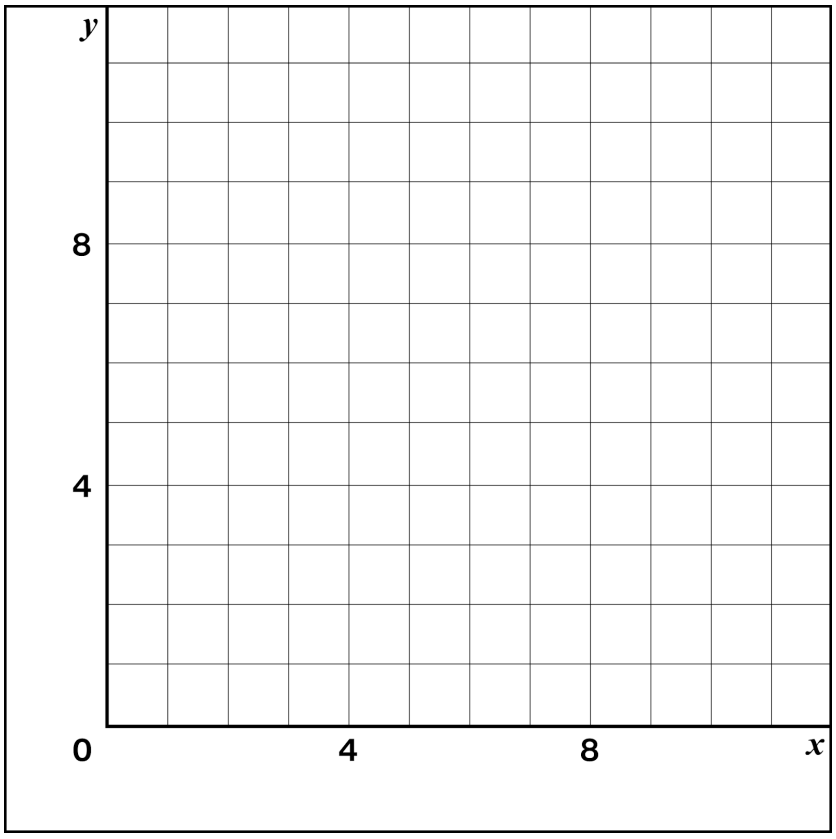
Unit 8.3, Lesson 5: Practice Problems

3. Create a graph that shows three linear relationships with different y-intercepts using the following slopes, and write an equation for each line.

Slope	Equation
$\frac{1}{5}$	
$\frac{3}{5}$	
$\frac{6}{5}$	



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Unit 8.3, Lesson 5: Practice Problems

Answer Key

1.1 The slope of the line represents the cost for each class, which is $\$20$.

1.2 $y = 20x + 60$ or equivalent

2.1 *Responses vary.* The slope of $\frac{1}{4}$ means that each ticket is $\$0.25$. The intercept of 8 represents the $\$8$ already in the cash box.

2.2 *Responses vary.* The slope shows that $\$2$ are added for each muffin ordered. The intercept of 3 probably represents a $\$3$ delivery fee or tip for the order.

3. *Responses vary.*

- ✓ $y = \frac{1}{5}x + 1$
- ✓ $y = \frac{3}{5}x + 3$
- ✓ $y = \frac{6}{5}x + 5$

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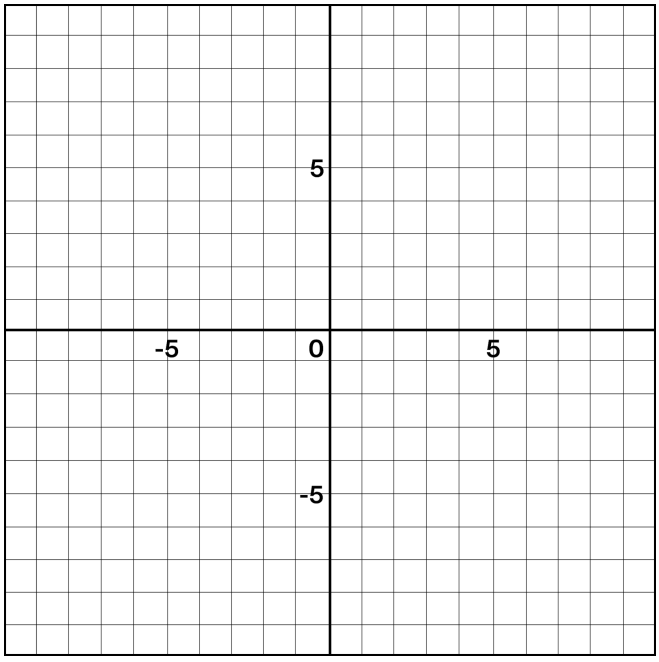
Unit 8.3, Lesson 6: Practice Problems Name _____

1. Select **all** of the equations that would produce graphs with the same y-intercept.

   - ☐ $y = 3x - 8$
   - ☐ $y = 3x - 9$
   - ☐ $y = 3x + 8$
   - ☐ $y = 5x - 8$
   - ☐ $y = 2x - 8$
   - ☐ $y = \frac{1}{3}x - 8$

2. Sketch the lines $y = \frac{1}{4}x$ and $y = \frac{1}{4}x - 5$ on the same set of axes.



Is one a translation of the other? Explain your thinking.

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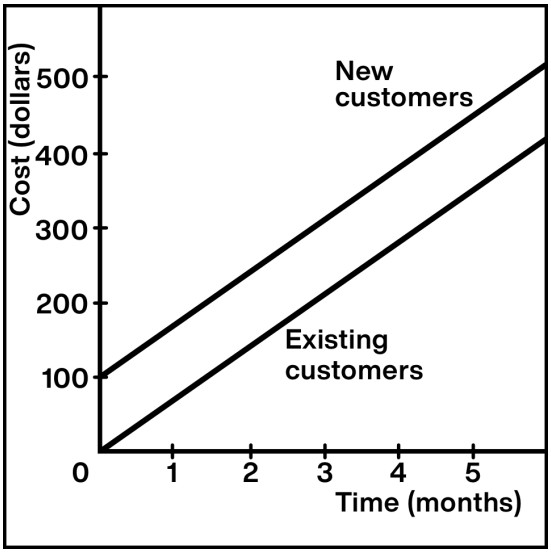
Unit 8.3, Lesson 6: Practice Problems

A cable company charges its existing customers $\$70$ per month for cable service.

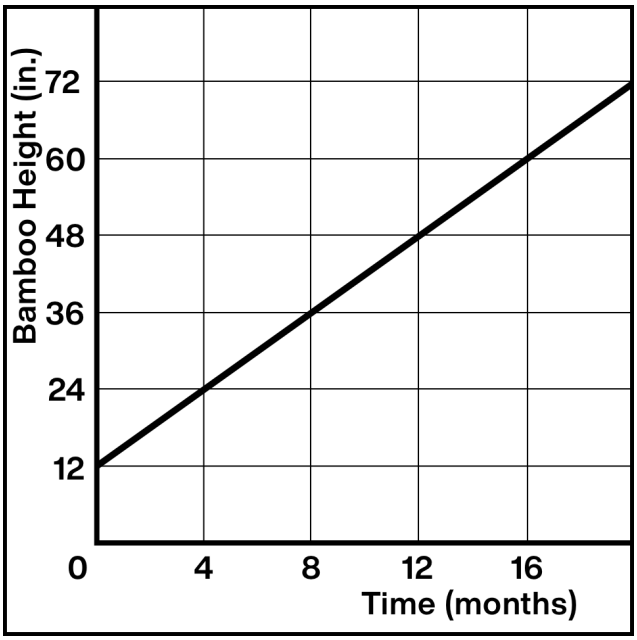


3.1 Write a linear equation representing the relationship between the number of months of service, x, and the total amount paid in dollars by an existing customer, y.

3.2 For new customers, there is an additional one-time service fee of $\$100$. Write a linear equation representing the relationship between the number of months of service, x, and the total amount paid in dollars by a **new** customer, y.

3.3 Describe a transformation that takes the line for the existing customers onto the line for the new customers.

This graph shows the height in inches, h, of a bamboo plant t months after it has been planted.



4.1 Write an equation that describes the relationship between t and h.

4.2 After how many months will the bamboo plant be 66 inches tall?

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Unit 8.3, Lesson 6: Practice Problems

Answer Key

1. (Unit 3, Lesson 8)

   ✓ $y = 3x - 8$
   ✓ $y = 5x - 8$
   ✓ $y = 2x - 8$
   ✓ $y = \frac{1}{3}x - 8$

2. (Unit 3, Lesson 8)

   Yes. *Explanations vary.*

   - The graphs have the same slope of $\frac{1}{4}$ but different y-intercepts. The first y-intercept is 0, and the second is -5.
   - Each (x, y) on the first graph is translated down by 5 to get a corresponding point on the second graph.

3.1 (Unit 3, Lesson 8)

$y = 70x$

3.2 (Unit 3, Lesson 8)

$y = 70x + 100$

3.3 (Unit 3, Lesson 8)

The two lines are parallel, therefore they have the same slope. A vertical translation of 100 units upward would take the "existing customers" line to the "new customers" line.

4.1 $h = 3t + 12$

4.2 18 months. Substitute $h = 66$, and solve the equation $66 = 3t + 12$. $3t = 54$, so $t = 18$.

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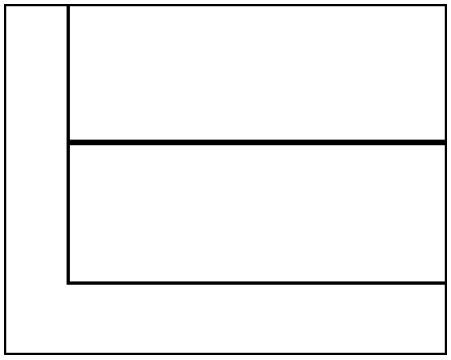
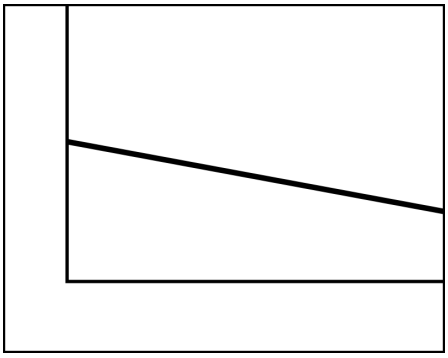
Unit 8.3, Lesson 7: Practice Problems Name _____

1. Draw a line to match each scenario with its graph. Then say whether the slope is positive, negative, or zero.

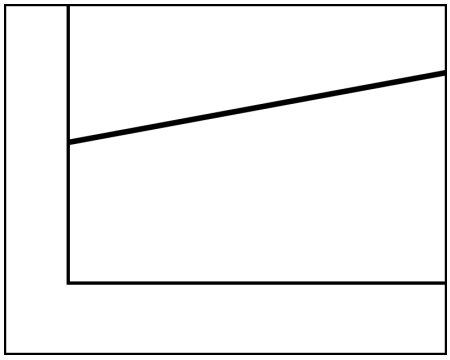
A. The car is speeding up at a rate of 5 miles per minute.



B. The car is maintaining a constant speed of 30 miles per hour.



C. The car is slowing down at a rate of 10 miles per minute.

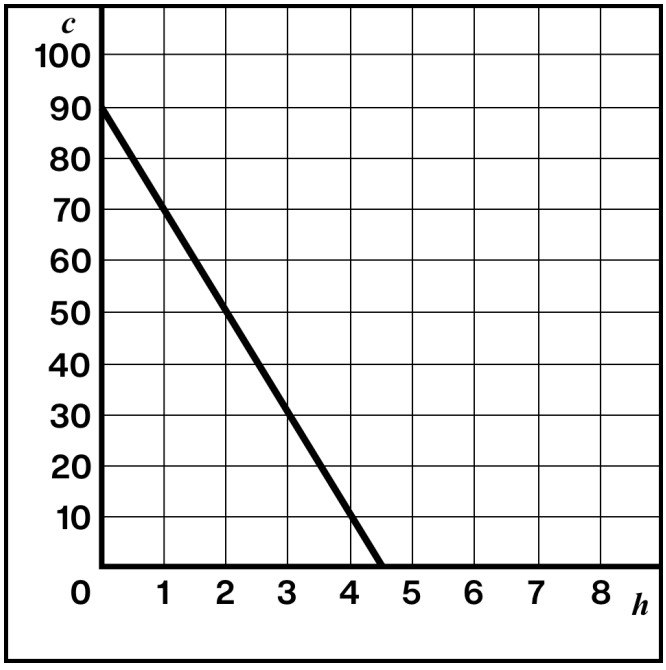


I monitor the amount of battery left on my computer so I can make sure it doesn't die at the wrong time. My battery loses charge at a constant rate. This graph shows the percent of charge left on my computer, c, after I have been awake for h hours.

2.1 What was the percent charge when I woke up?

2.2 Write an equation that describes the relationship between c and h.

2.3 How many hours will I have been awake when my computer has no charge left?



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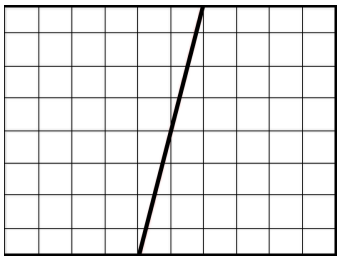
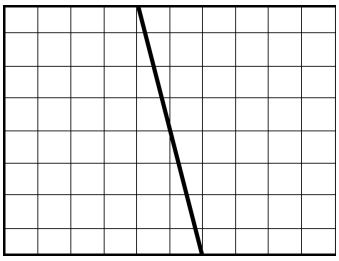
Unit 8.3, Lesson 7: Practice Problems

3. Draw a line to match each line with its slope. (A square grid represents 1 unit on each side).



$\frac{1}{4}$



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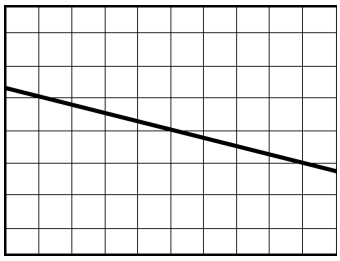
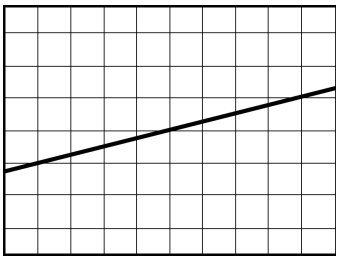


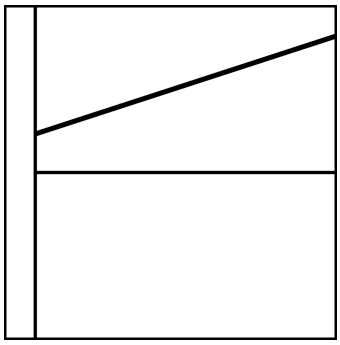
$-\frac{1}{4}$



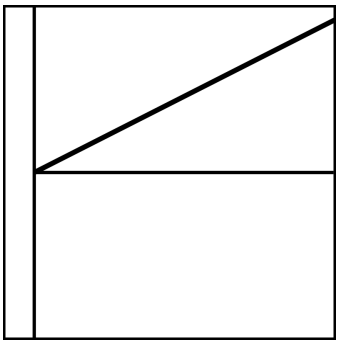
-4

4. Draw a line to match each scenario to its graph.

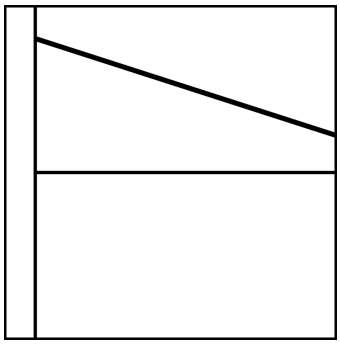
A. y is the weight of a kitten x days after birth.



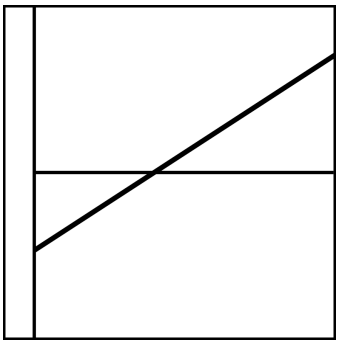
B. y is the temperature in $^\circ$C. x is the temperature in $^\circ$F.



C. y is the distance left to go in a car ride after x hours of driving at a constant rate towards its destination.



D. y is the amount of calories consumed eating x crackers.



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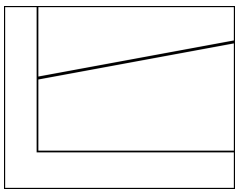
Unit 8.3, Lesson 7: Practice Problems

Answer Key

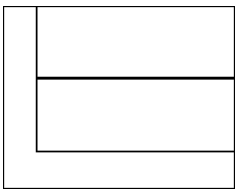
1.

A. The car is speeding up at a rate of 5 miles per minute.



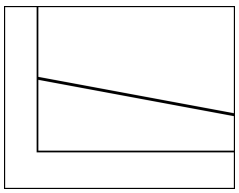
Positive Slope

B. The car is maintaining a constant speed of 30 miles per hour.



Zero Slope

C. The car is slowing down at a rate of 10 miles per minute.



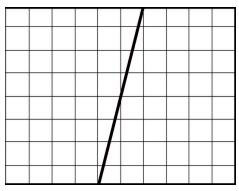
Negative Slope

2.1 90 percent charge. The y-intercept represents this initial percent charge when I woke up.

2.2 $c = 90 - 20h$ (or equivalent)

2.3 4.5 hours. On the graph, $c = 0$ when $h = 4.5$. The equation can be used to solve for h when $c = 0$. $0 = -20h + 90$ is $-90 = -20h$, which is $h = 4.5$.

3.



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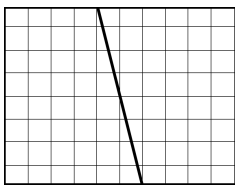

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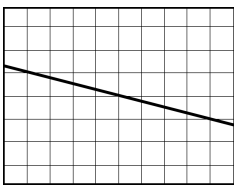
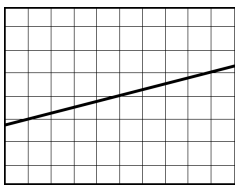


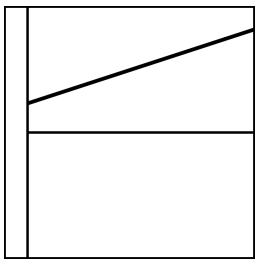
$-\frac{1}{4}$



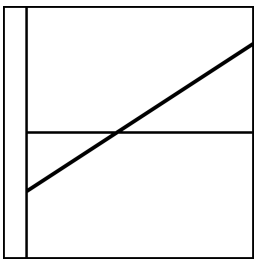
$\frac{1}{4}$

4.

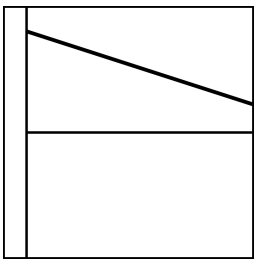
A. y is the weight of a kitten x days after birth.



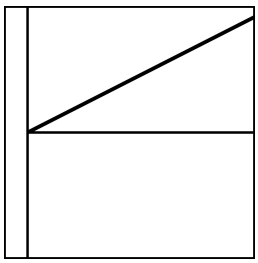
B. y is the temperature in $^\circ$C. x is the temperature in $^\circ$F.



C. y is the distance left to go in a car ride after x hours of driving at a constant rate toward its destination.



D. y is the amount of calories consumed eating x crackers.



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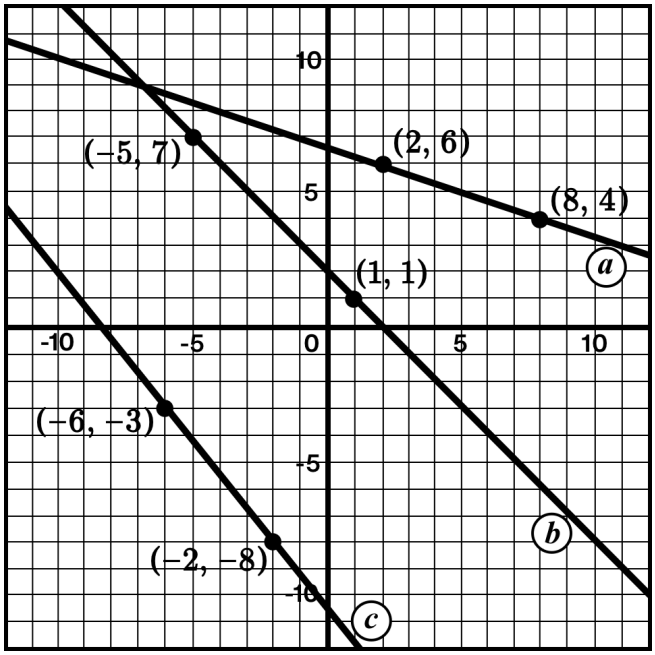
Unit 8.3, Lesson 8: Practice Problems Name _____

1. Calculate the slope of each line.

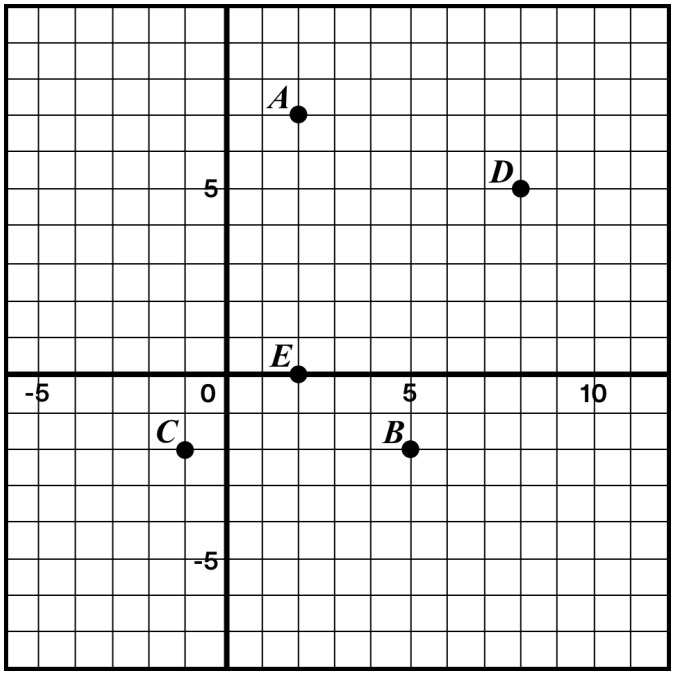


Line	Slope
a	
b	
c	

2. Which pairs of points have lines passing through them with a slope of $\frac{2}{3}$?

- ☐ $(0, 0)$ and $(2, 3)$
- ☐ $(0, 0)$ and $(3, 2)$
- ☐ $(1, 5)$ and $(4, 2)$
- ☐ $(-2, -2)$ and $(4, 2)$
- ☐ $(20, 30)$ and $(-20, -30)$

Draw a line with the given slope through the given point.



3.1 Through point A with a slope of -3.

Which other point lies on that line?

3.2 Through point A with slope of $-\frac{1}{3}$.

Which other point lies on that line?

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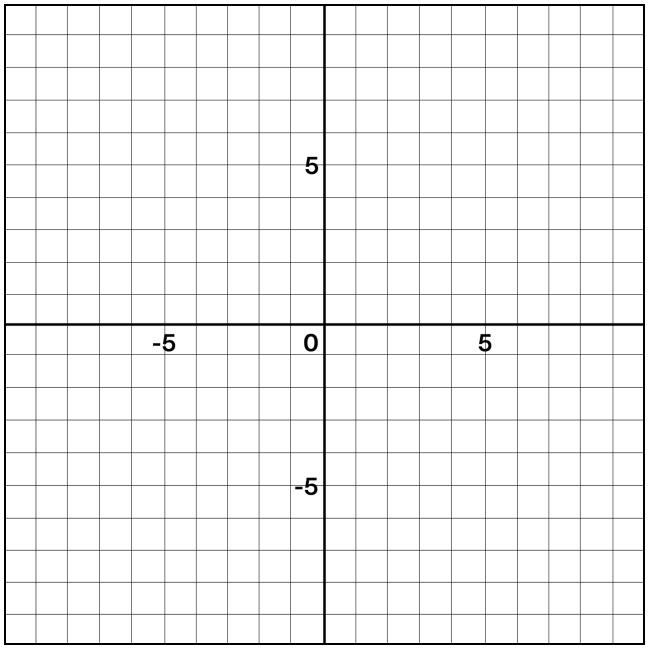
Unit 8.3, Lesson 8: Practice Problems

4. Write a letter in each box to match each pair of points to the slope of the line that joins them.

A. -3		$(5, -6)$ and $(2, 3)$
B. 4		$(-8, -11)$ and $(-1, -5)$
C. $\frac{6}{7}$		$(9, 10)$ and $(7, 2)$
D. $-\frac{5}{2}$		$(6, 3)$ and $(5, -1)$
		$(4, 7)$ and $(6, 2)$

5.1 Draw a line with a slope of 4 and a negative y-intercept.



5.2 Show how you know the slope is 4.

5.3 Write an equation for the line.

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Unit 8.3, Lesson 8: Practice Problems

Answer Key

1. (Unit 2, Lesson 10)

Line	Slope
a	$-\frac{1}{3}$
b	-1
c	$-\frac{5}{4}$

2. ✓ $(0, 0)$ and $(3, 2)$

   ✓ $(-2, -2)$ and $(4, 2)$

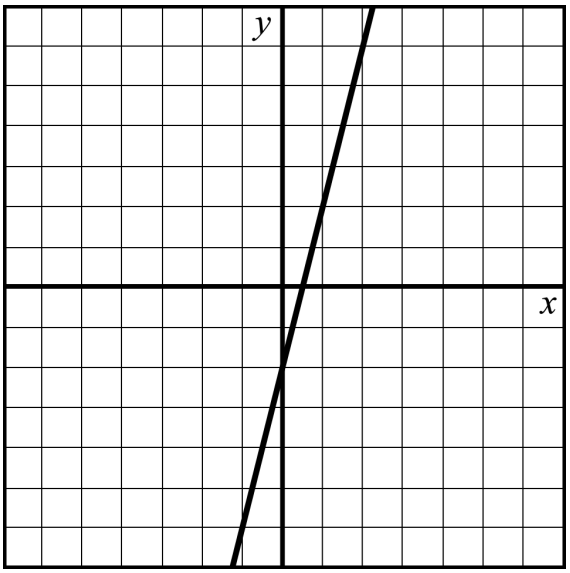
3.1 Point B

3.2 Point D

4.

A. -3	**A**	$(5, -6)$ and $(2, 3)$
B. 4	**C**	$(-8, -11)$ and $(-1, -5)$
C. $\frac{6}{7}$	**B**	$(9, 10)$ and $(7, 2)$
D. $-\frac{5}{2}$	**B**	$(6, 3)$ and $(5, -1)$
	D	$(4, 7)$ and $(6, 2)$

5.1 (Unit 3, Lesson 6) *Responses vary.*



5.2 (Unit 3, Lesson 6)

I can tell the slope is 4 by looking at the points $(0, -2)$ and $(1, 2)$ since $\frac{2--2}{1-0} = \frac{4}{1} = 4$.

5.3 $y = 4x - 2$

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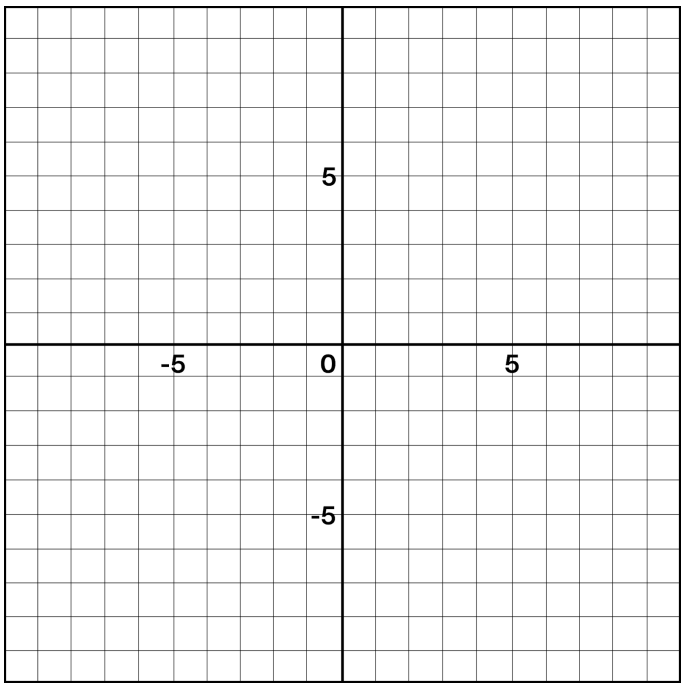
Unit 8.3, Lesson 9: Practice Problems Name _____

1.1 Suppose you wanted to graph the equation $y = -4x - 1$. Describe the steps you would take to draw the graph.

1.2 How would you check that the graph you drew is correct?

Graph the following lines and then write an equation for each:



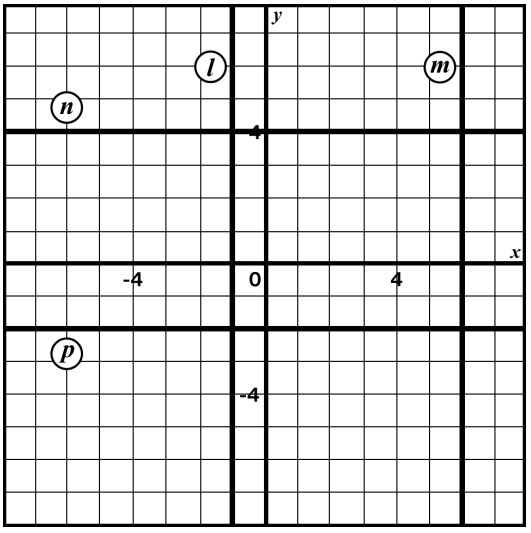
2.1 A line with a slope of 0 and a y-intercept of 5.

2.2 A line with a slope of 2 and a y-intercept of -1.

2.3 A line with a slope of $-\frac{1}{2}$ and a y-intercept of 1.

3. Write an equation for each line.

Line	Equation
l	
m	
n	
p	



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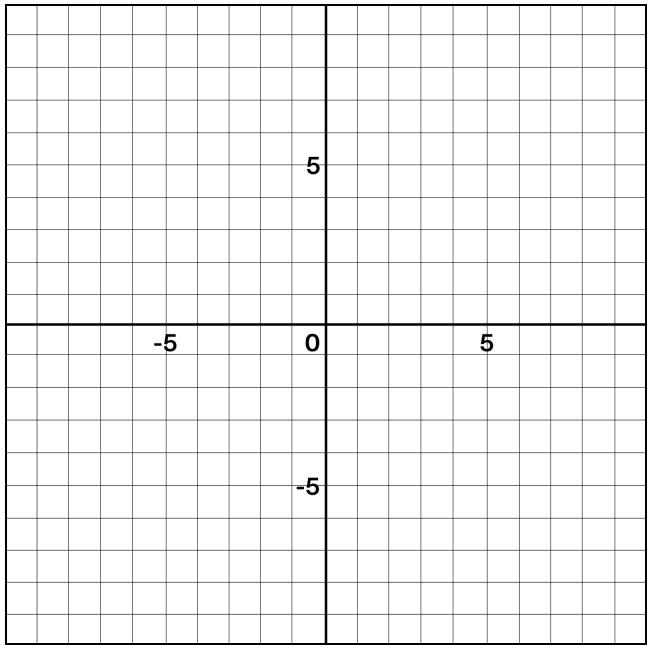
Unit 8.3, Lesson 9: Practice Problems

4. Write an equation for a line that passes through $(2, 5)$ and $(6, 7)$.



A publisher wants to know the thickness of a new book. The book has a front cover and a back cover, each with a thickness of $\frac{1}{4}$ of an inch. The paper has a thickness of $\frac{1}{4}$ inch per 100 pages.

5.1 Write an equation that represents the total width of the book, y, for every 100 pages of paper, x.

5.2 The publisher chooses to have front and back covers with a thickness of $\frac{1}{3}$ of an inch instead. Write an equation that represents the **new** total width of the book, y, for every 100 pages of paper, x.

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Unit 8.3, Lesson 9: Practice Problems

Answer Key

1.1 *Responses vary.* I would draw the graph by starting with the intercept $(0, -1)$. Use the slope of -4 to find other points by increasing by 1 on the x-axis and decreasing by 4 on the y-axis. Then find two or more solutions to the equation and graph the points whose coordinates are the ordered pairs of the solutions. Then draw a line connecting the points.

1.2 *Responses vary.* I would check by identifying the coordinates of some points on the line and substitute them into the equation to make sure they make the equation true.

2.1 $y = 5$

2.2 $y = 2x - 1$

2.3 $y = -\frac{1}{2}x + 1$

3.

Line	Equation
l	$x = -1$
m	$x = 6$
n	$y = 4$
p	$y = -2$

4. $y = \frac{1}{2}x + 4$ (or equivalent)

5.1 $y = \frac{1}{2} + \frac{1}{4}x$

5.2 $y = \frac{2}{3} + \frac{1}{4}x$