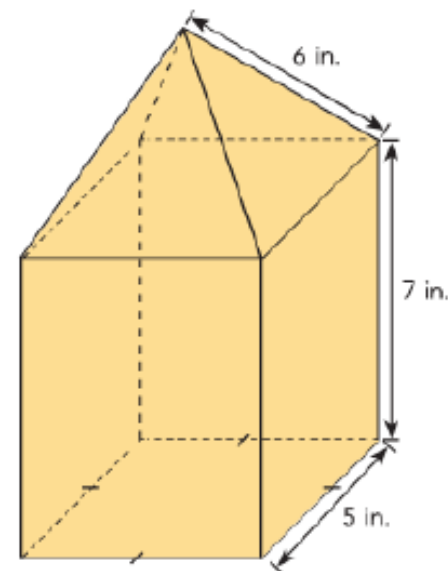
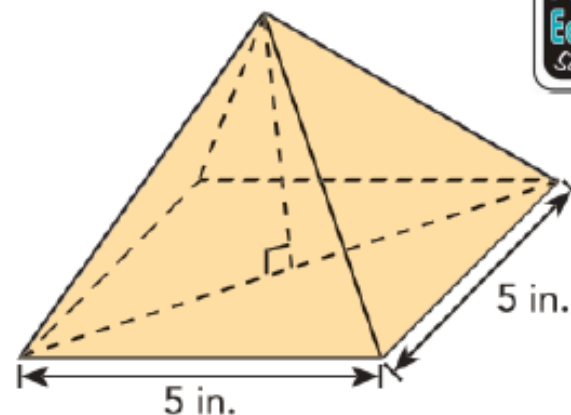


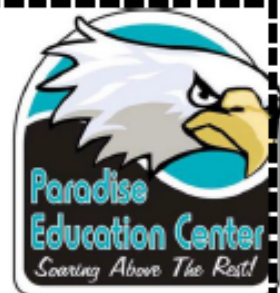
Week 8 Wednesday Course 3 Warm-up

$$\text{Volume} = \frac{1}{3} \cdot \text{Area of base} \cdot \text{Height}$$

Find the volume of the square pyramid

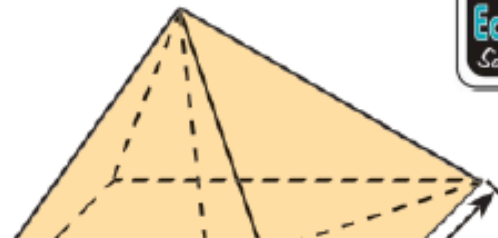


Week 8 Wednesday Course 3 Warm-up

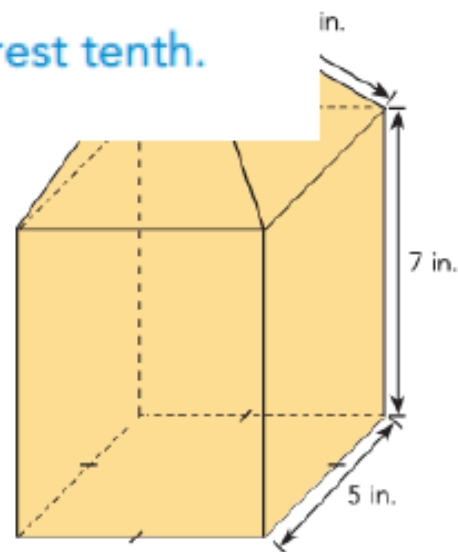


$$\text{Volume} = \frac{1}{3} \cdot \text{Area of base} \cdot \text{Height}$$

Find the volume of the square pyramid



$$\begin{aligned} \text{Volume of pyramid} &= \frac{1}{3} \cdot \text{Area of base} \cdot \text{Height} \\ &= \frac{1}{3} \cdot 25 \cdot \sqrt{23.5} && \text{Use the exact value of height.} \\ &\approx 40.4 \text{ in}^3 && \text{Round to the nearest tenth.} \end{aligned}$$



Lesson 8.4 Dilations Day 1

Objective

TSW understand concept of dilation

***drawing images after dilation**

*find coordinates of points after dilation

*find the center of dilation

Common Core State Standards

8G1 Verify experimentally the properties of rotations, reflections, and translations.

8G1 c Parallel lines are taken to parallel lines

Mathematical Practices *MP3 Construct arguments MP 4 Model Mathematics MP5 Use tools strategically*



▶ Geometric transformations move figures about on a plane. Each type of transformation changes some properties of a figure, but leaves other properties unchanged.

Lesson 8.4 Dilations Day 1

8.4 Rotations Day 1

TSW understand concept of dilation

*drawing images after dilation

*find coordinates of points after
dilation

*find the center of dilation

Vocabulary

Dilation- the enlargement or reduction of a figure

Scale Factor

Center of Dilation

Lesson 8.4 Dilations Day 1

Vocabulary

Dilation- the enlargement or reduction of a figure

Scale Factor

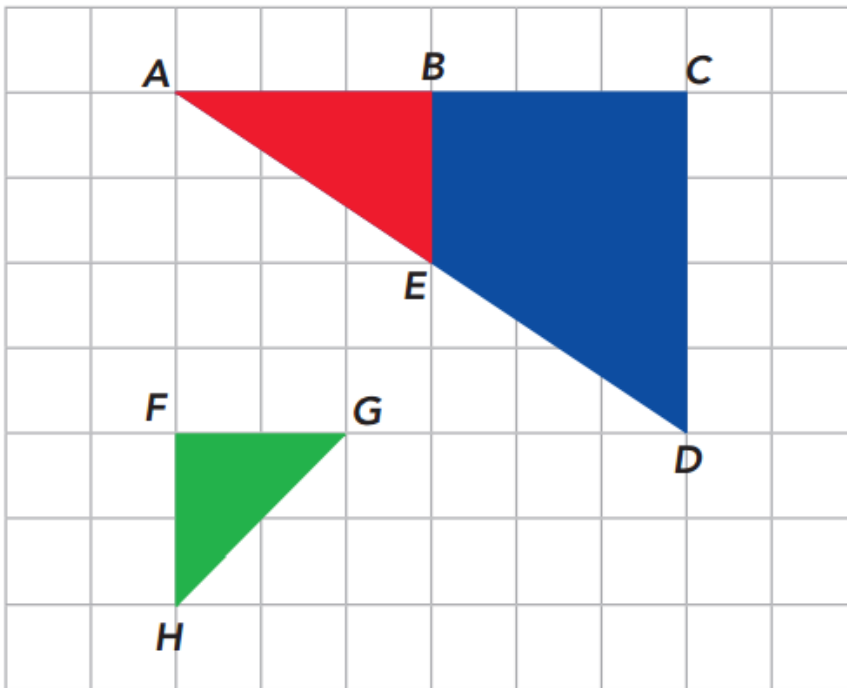
$$\text{Scale factor} = \frac{\text{Distance from the center of dilation to image point}}{\text{Distance from the center of dilation to original point}}$$

Center of Dilation

Lesson 8.4 Dilations Day 1

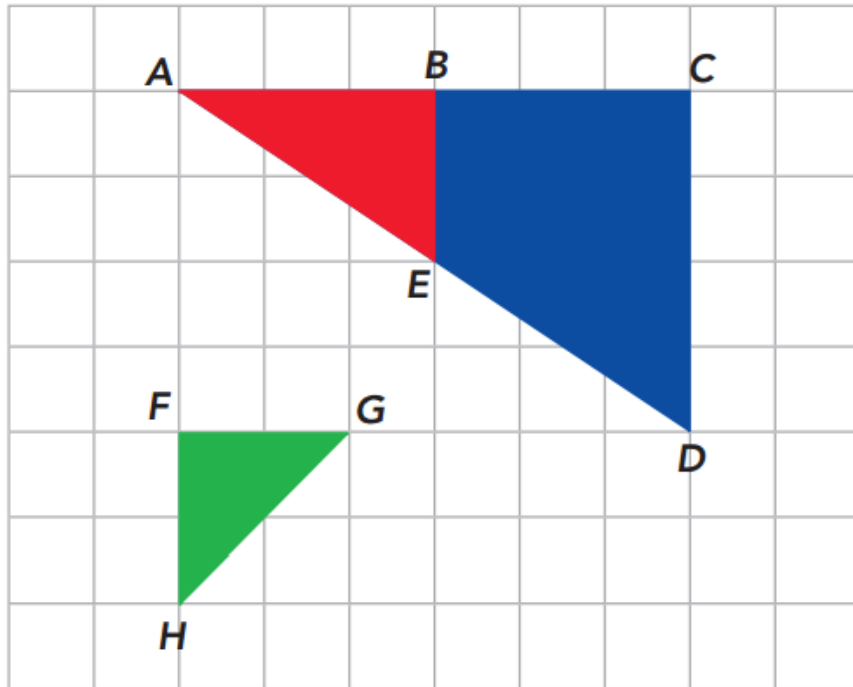
Example 14 Understand the concept of dilation.

Mrs. Tonelli cuts three triangles from colored paper and pastes them on a board. Which triangles are dilations of one another?



Example 14 Understand the concept of dilation.

Mrs. Tonelli cuts three triangles from colored paper and pastes them on a board. Which triangles are dilations of one another?



Solution

$\triangle ABE$ and $\triangle ACD$ are dilations of one another, because they have a center of dilation, A , and the sides of $\triangle ACD$ are twice as long as the sides of $\triangle ABE$.

$\triangle FGH$ is not a dilation of the other two triangles, since it does not share a center of dilation with them.

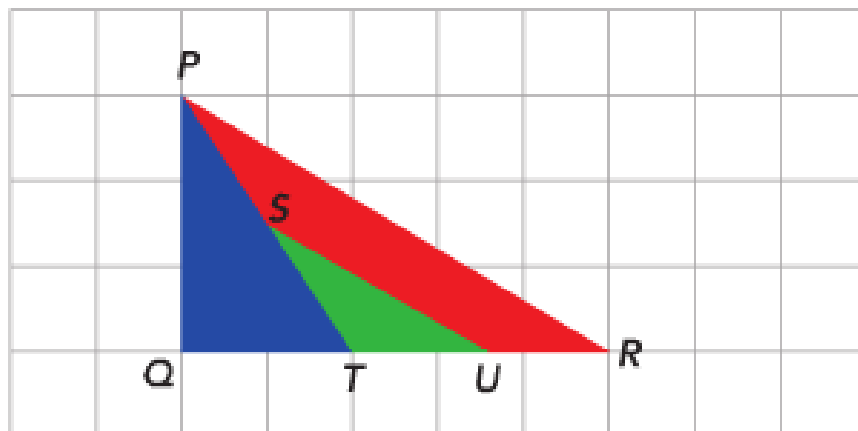
Lesson 8.4 Dilations Day 1

Guided Practice

Solve.

- 1 Which triangles are dilations of one another? Explain.

a)



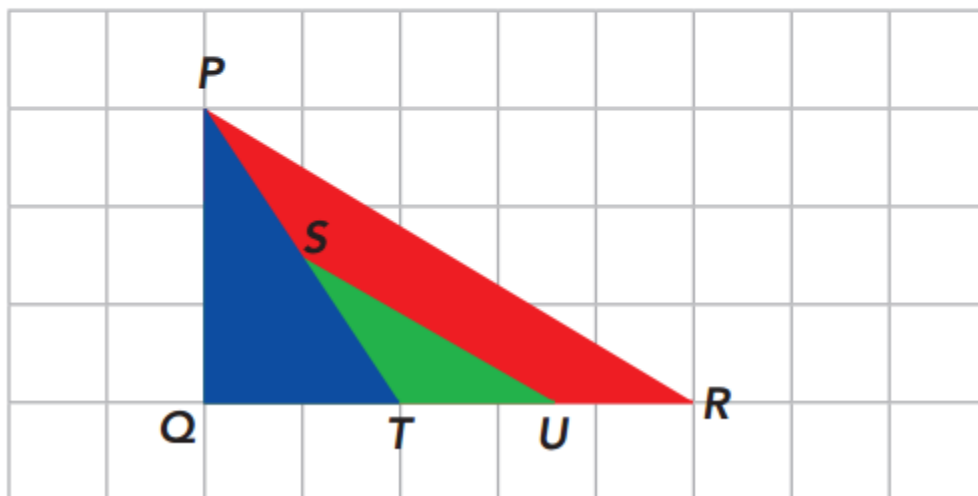
Lesson 8.4 Dilations Day 1

Guided Practice

Solve.

- 1 Which triangles are dilations of one another? Explain.

a)



$\triangle STU$ and $\triangle PTR$; The dilation, T , and the side lengths are twice as long as the side lengths of $\triangle STU$.

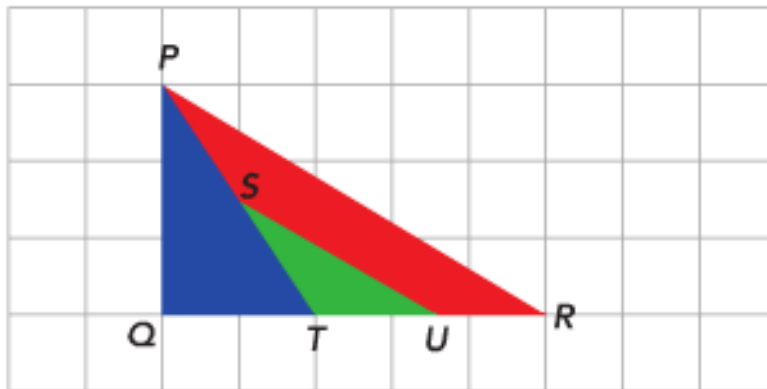
Lesson 8.4 Dilations Day 1

Guided Practice

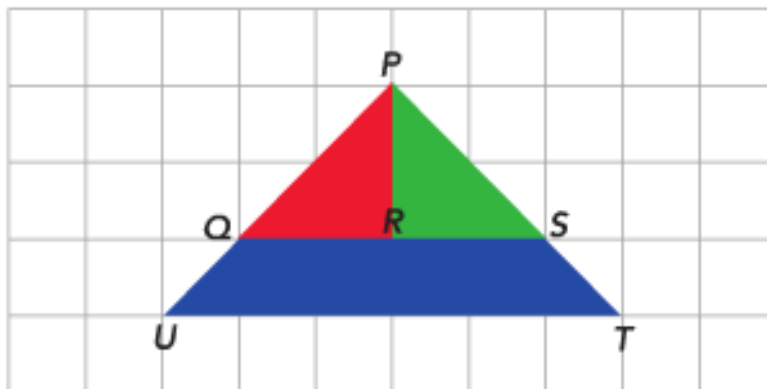
Solve.

1 Which triangles are dilations of one another? Explain.

a)



b)



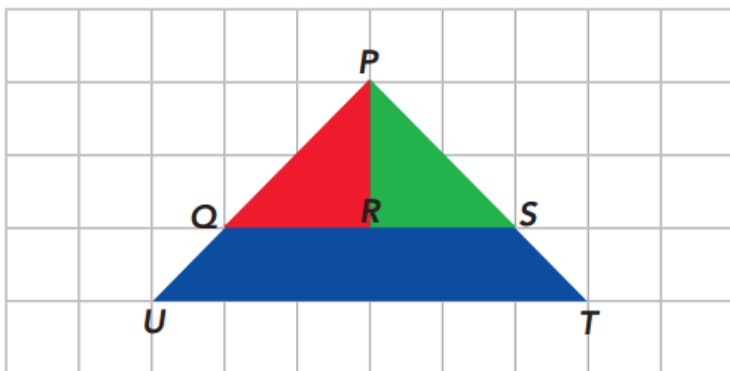
Lesson 8.4 Dilations Day 1

Guided Practice

Solve.

1 Which triangles are dilations of one another? Explain.

b)



$\triangle PQS$ and $\triangle PUT$; They have a center of dilation, P , and the sides of $\triangle PUT$ are $1\frac{1}{2}$ times as long as the sides of $\triangle PQS$.

Lesson 8.4 Dilations Day 1

Example 15 Find the dimensions of figures after dilations.

Mrs. Marquez is making pancakes on a griddle. At first, the pancake batter forms a 4-inch circle. It flows to become a bigger circle. The scale factor of the dilation is 1.5. Find the diameter of the pancake.



Lesson 8.4 Dilations Day 1

Example 15 Find the dimensions of figures after dilations.

Mrs. Marquez is making pancakes on a griddle. At first, the pancake batter forms a 4-inch circle. It flows to become a bigger circle. The scale factor of the dilation is 1.5. Find the diameter of the pancake.

Solution

The pancake is a dilated image of the pancake batter.

$$\begin{aligned}\text{Diameter of pancake} &= \text{Diameter of pancake batter} \cdot \text{Scale factor} \\ &= 4 \cdot 1.5 \\ &= 6 \text{ in.}\end{aligned}$$

The diameter of the pancake is 6 inches.



Lesson 8.4 Dilations Day 1

Guided Practice

Copy and complete.

2 A rectangle has coordinates $A(5, 1)$, $B(3, 1)$, $C(3, 4)$, and $D(5, 4)$.

a) Find the length and width of $ABCD$.

The length of $ABCD$ is $\underline{\quad?}$ units. Its width is $\underline{\quad?}$ units.

b) Find the length and width of the image of $ABCD$ when dilated with scale factor 2.

Length of image: $\underline{\quad?}$ \cdot $\underline{\quad?}$ $=$ $\underline{\quad?}$ units

Width of image: $\underline{\quad?}$ \cdot $\underline{\quad?}$ $=$ $\underline{\quad?}$ units

c) Find the length and width of the image of $ABCD$ when dilated with scale factor $\frac{1}{2}$.

Length of image: $\underline{\quad?}$ \cdot $\underline{\quad?}$ $=$ $\underline{\quad?}$ units

Width of image: $\underline{\quad?}$ \cdot $\underline{\quad?}$ $=$ $\underline{\quad?}$ units

d) What are the coordinates of the image rectangle under each dilation if the center of dilation is at the origin?

	Scale Factor 2	Scale Factor $\frac{1}{2}$
A maps onto	($\underline{\quad?}$, $\underline{\quad?}$)	($\underline{\quad?}$, $\underline{\quad?}$)
B maps onto	($\underline{\quad?}$, $\underline{\quad?}$)	($\underline{\quad?}$, $\underline{\quad?}$)
C maps onto	($\underline{\quad?}$, $\underline{\quad?}$)	($\underline{\quad?}$, $\underline{\quad?}$)
D maps onto	($\underline{\quad?}$, $\underline{\quad?}$)	($\underline{\quad?}$, $\underline{\quad?}$)

You may want to draw the rectangle and its images on the coordinate plane to solve c).



Guided Practice

Copy and complete.

2 A rectangle has coordinates A (5, 1), B (3, 1), C (3, 4), and D (5, 4).

a) Find the length and width of ABCD.

The length of ABCD is ? units. Its width is ? units. 3; 2

b) Find the length and width of the image of ABCD when dilated with scale factor 2.

Length of image: ? · ? = ? units 3; 2; 6

Width of image: ? · ? = ? units 2; 2; 4

c) Find the length and width of the image of ABCD when dilated with scale factor $\frac{1}{2}$.

Length of image: ? · ? = ? units 3; $\frac{1}{2}$; $1\frac{1}{2}$

Width of image: ? · ? = ? units 2; $\frac{1}{2}$; 1

d) What are the coordinates of the image rectangle under each dilation if the center of dilation is at the origin?

	Scale Factor 2	Scale Factor $\frac{1}{2}$
A maps onto	(<u> ?</u> , <u> ?</u>)	(<u> ?</u> , <u> ?</u>)
B maps onto	(<u> ?</u> , <u> ?</u>)	(<u> ?</u> , <u> ?</u>)
C maps onto	(<u> ?</u> , <u> ?</u>)	(<u> ?</u> , <u> ?</u>)
D maps onto	(<u> ?</u> , <u> ?</u>)	(<u> ?</u> , <u> ?</u>)

You may want to draw the rectangle and its images on the coordinate plane to solve c).

See margin.



d) Scale factor 2: (10, 2); (6, 2);
(6, 8); (10, 8)
Scale factor $\frac{1}{2}$: (2.5, 0.5);
(1.5, 0.5); (1.5, 2); (2.5, 2)

Lesson 8.4 Dilations Day 1

Practice 8.4 #1-3

Name: _____ Date: _____

Practice 8.4

Tell whether each transformation is a dilation. Explain.

1

2

Solve. Show your work.

3 Nikita wants to make a mosaic for a T-shirt's design. She makes some dilated copies of a drawing with a photocopier. The drawing is 6 inches by 4 inches. Find the length and width of each copy with the scale factor given in a) to d). State whether each copy is an enlargement or reduction of the drawing.

a) 1.5 b) 2
c) $\frac{1}{4}$ d) 140%

Copy and complete on graph paper.

4 Timothy uses a lens to view a 2-inch pencil that is represented by \overline{AB} on the coordinate plane. \overline{AB} is mapped onto $\overline{A'B'}$ by a dilation with center at the origin, O . Draw each image for the given scale factor.

a) Scale factor -0.5 b) Scale factor 0.5

Course 3

Challenge-

*Solve created equations

“Pick a Snowflake”

*BuzzMath



 Lesson Check #1- understand the meaning of dilation

Lesson 8.4 Dilations Day 1

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented **CONNECTED** to what you already knew?
2. What new ideas did you get that **EXTENDED** or pushed your thinking in new directions?
3. What is still **CHALLENGING** or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?