

Warm Up

If $\triangle ABC \sim \triangle DEF$, find each value.

1. EF

$$\frac{20}{8} = \frac{18}{EF}$$

$$EF = 7.2$$

2. AC

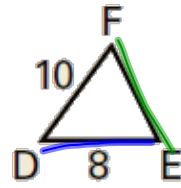
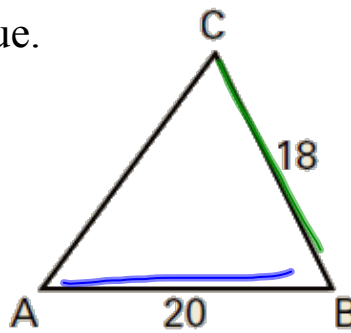
$$\frac{20}{8} = \frac{AC}{10}$$

$$AC = 25$$

3. scale factor of $\triangle ABC$ to $\triangle DEF$

$$20:8$$

$$\frac{20}{8}$$

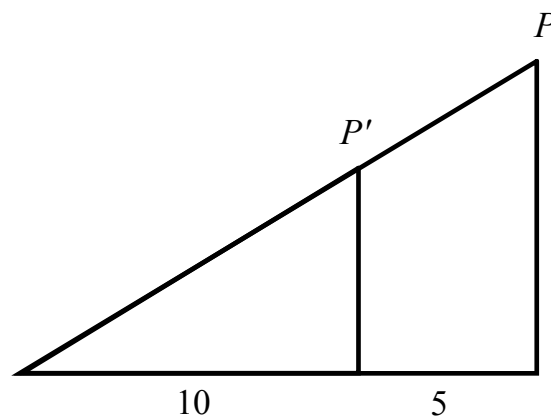


9-7 DILATIONS

Dilation - stretch or shrink
always similar

Scale factor - relationship between
sizes of figures

Ex 1 Find the scale factor of the dilation



scale factor =

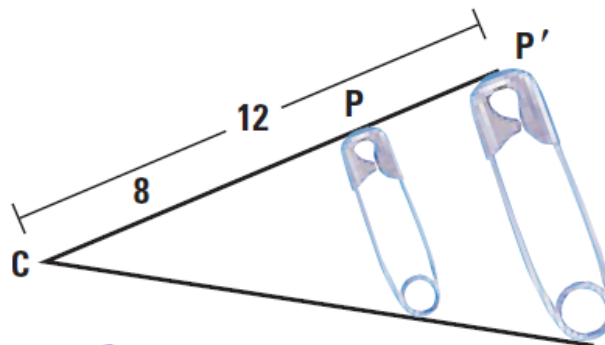
$$\frac{\text{new}}{\text{original}}$$

$$15 \cdot x = 10$$

↑
scale factor

$$x = \frac{10}{15} = \frac{2}{3}$$

Ex 2 Find the scale factor of the dilation



$$\frac{12}{8} = \frac{3}{2} = 1.5 = 1\frac{1}{2}$$

Ex 3 Simplify:

$$7 \begin{bmatrix} 2 & -1 & 5 \\ 3 & 4 & -2 \end{bmatrix} = \begin{bmatrix} 14 & -7 & 35 \\ 21 & 28 & -14 \end{bmatrix}$$

Ex 4 Simplify:

$$-6 \begin{bmatrix} 4 & 0 & -3 \\ 5 & 6 & 1 \end{bmatrix} = \begin{bmatrix} -24 & 0 & 18 \\ -30 & -36 & -6 \end{bmatrix}$$

Ex 5 Use scalar multiplication to find the image of $WXYZ$ after a dilation with the center at the origin and a scale factor

of $\frac{1}{2}$

$$W(-2, -4)$$

$$X(-4, -4)$$

$$Y(2, 8)$$

$$Z(6, 2)$$

$$W'(-1, -2)$$

$$X'(-2, -2)$$

$$\frac{1}{2} \begin{bmatrix} \overset{W}{-2} & \overset{X}{-4} & \overset{Y}{2} & \overset{Z}{6} \\ -4 & -4 & 8 & 2 \end{bmatrix} \begin{matrix} X \\ Y \end{matrix}$$

$$\begin{bmatrix} -1 & -2 & 1 & 3 \\ -2 & -2 & 4 & 1 \end{bmatrix}$$

Ex 6 Use scalar multiplication to find the image of $ABCD$ after a dilation with the center at the origin and a scale factor of 2.

$$A(5, -1)$$

$$B(2, 3)$$

$$C(-4, 1)$$

$$D(0, 6)$$

$$A'(10, -2)$$

$$B'(4, 6)$$

$$C'(-8, 2)$$

$$D'(0, 12)$$

Ex 7 Find the image of triangle LMN after the given composition.

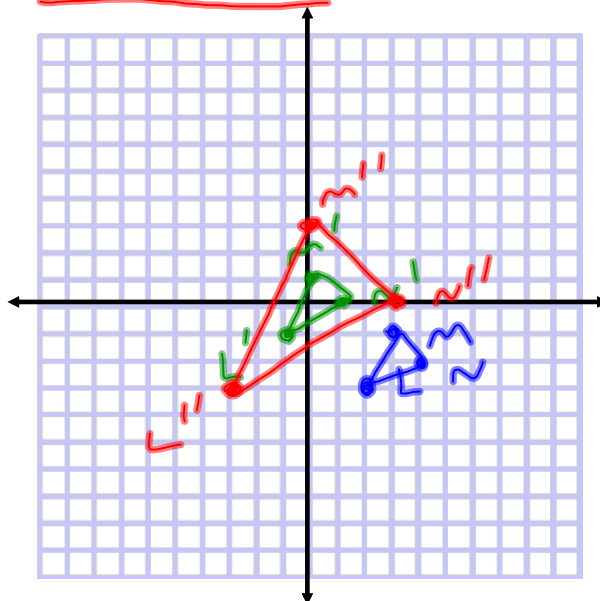
Translation: $(x, y) \rightarrow (x - 3, y + 2)$

Dilation: centered at the origin with scale factor = 3

$L(2, -3)$

$M(3, -1)$

$N(4, -2)$



Ex 8 Find the image of triangle ABC after the given composition.

Translation: $(x, y) \rightarrow (x + 1, y - 5)$

Dilation: centered at the origin with scale factor = 2

$A(2, 6)$

$B(-3, 4)$

$C(0, 2)$

