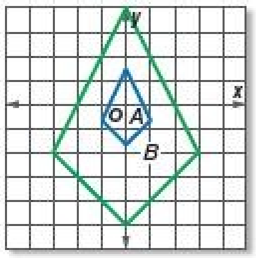
Determine whether the dilation from *A* to *B* is an *enlargement* or a *reduction*. Then find the scale factor of the dilation.

6. 

SOLUTION:

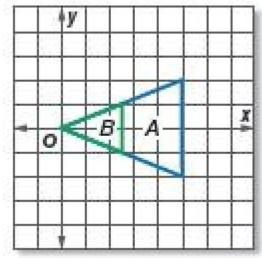
Kite *B* is larger than kite *A*, so the dilation is an enlargement.

The distance between the vertices at (0, 0) and (0, 4) for *B* is 4 – 0 = 4 units and between the vertices at (0, 0) and $\left(0, \frac{4}{3}\right)$ for *A* is $\frac{4}{3}$.

So, the scale factor is $\frac{4}{\frac{4}{3}} = 4 \cdot \frac{3}{4} = 3$.

ANSWER:

enlargement; 3

7. 

SOLUTION:

Triangle *B* is smaller than triangle *A*, so the dilation is a reduction.

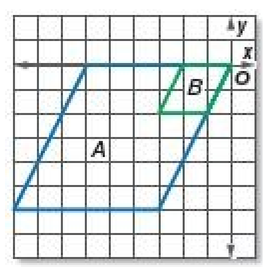
The distance between the vertices at (0, 0) and (5, 2) for A is $\sqrt{(2-0)^2+(5-0)^2} = \sqrt{2^2+5^2} = \sqrt{4+25} = \sqrt{29}$

The distance between the vertices at (0, 0) and (2.5, 1) for B is $\sqrt{(1-0)^2+(2.5-0)^2} = \sqrt{1^2+2.5^2} = \sqrt{1+6.25} = \sqrt{7.25}$

So, the scale factor is $\frac{\sqrt{7.25}}{\sqrt{29}} \approx \frac{2.69}{5.39} = \frac{1}{2}$.

ANSWER:

reduction; $\frac{1}{2}$

8. 

SOLUTION:

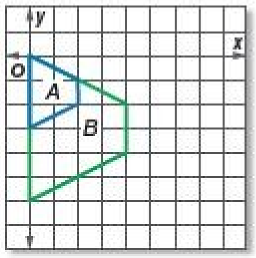
Parallelogram *B* is smaller than parallelogram *A*, so the dilation is a reduction.

The distance between the vertices at (0, 0) and (-6, 0) for *A* is 6 and between the vertices at (0, 0) and (–2, 0) for *B* is 2.

So the scale factor is $\frac{2}{6}$ or $\frac{1}{3}$.

ANSWER:

reduction; $\frac{1}{3}$

9. 

SOLUTION:

Trapezoid *B* is larger than trapezoid *A*, so the dilation is an enlargement.

The distance between the vertices at (0, 0) and (0, –6) for *B* is 6 and between the vertices at (0, 0) and (0, –3) for *A* is 3. So the scale factor is $\frac{6}{3}$ or 2.

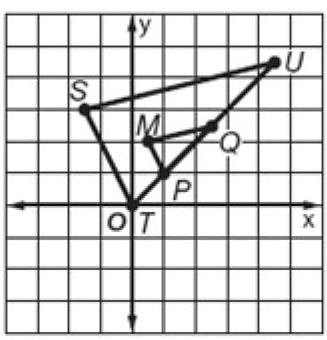
ANSWER:

enlargement; 2

Graph the original figure and its dilated image. Then verify that the dilation is a similarity transformation.

14. *M*(1, 4), *P*(2, 2), *Q*(5, 5); *S*(–3, 6), *T*(0, 0), *U*(9, 9)

SOLUTION:



Use the distance formula to find the lengths of the sides.

$$MP = \sqrt{(2-1)^2 + (2-4)^2} = \sqrt{1+4} = \sqrt{5}$$

$$PQ = \sqrt{(5-2)^2 + (5-2)^2} = \sqrt{9+9} = 3\sqrt{2}$$

$$MQ = \sqrt{(5-1)^2 + (5-4)^2} = \sqrt{16+1} = \sqrt{17}$$

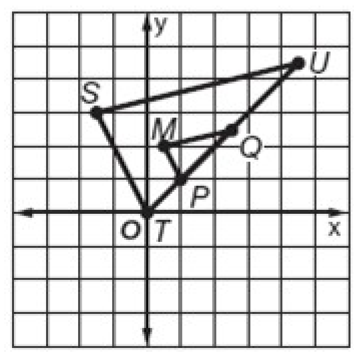
$$ST = \sqrt{(0-(-3))^2 + (0-6)^2} = \sqrt{9+36} = 3\sqrt{5}$$

$$TU = \sqrt{(9-0)^2 + (9-0)^2} = \sqrt{81+81} = 9\sqrt{2}$$

$$SU = \sqrt{(9-(-3))^2 + (9-6)^2} = \sqrt{144+9} = 3\sqrt{17}$$

$\frac{MP}{ST} = \frac{PQ}{TU} = \frac{MQ}{SU} = \frac{1}{3}$, so $\Delta MPQ \sim \Delta STU$ by SSS Similarity.

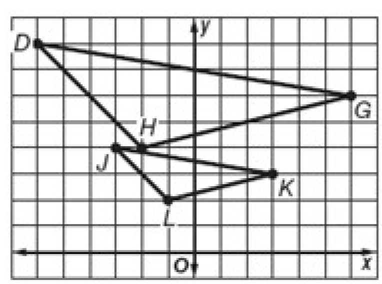
ANSWER:



$\frac{MP}{ST} = \frac{PQ}{TU} = \frac{MQ}{SU} = \frac{1}{3}$, so $\Delta MPQ \sim \Delta STU$ by SSS Similarity.

17. *J*(–6, 8), *K*(6, 6), *L*(–2, 4); *D*(–12, 16), *G*(12, 12), *H*(–4, 8)

SOLUTION:

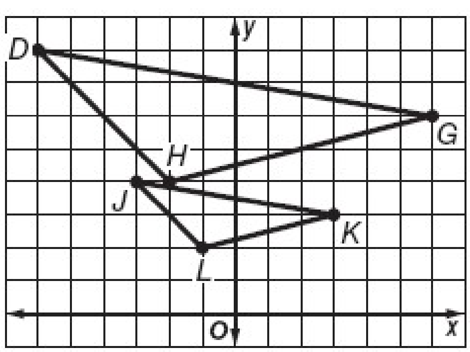


Use the distance formula to find the lengths of the sides.

$$JK = \sqrt{(6-(-6))^2 + (6-8)^2}$$
$$= \sqrt{144+4}$$
$$= 2\sqrt{37}$$
$$KL = \sqrt{(-2-6)^2 + (4-6)^2}$$
$$= \sqrt{64+4}$$
$$= 2\sqrt{17}$$
$$JL = \sqrt{(-2-(-6))^2 + (4-8)^2}$$
$$= \sqrt{16+16}$$
$$= 4\sqrt{2}$$
$$DG = \sqrt{(12-(-12))^2 + (12-16)^2}$$
$$= \sqrt{576+16}$$
$$= \sqrt{592}$$
$$= 4\sqrt{37}$$
$$GH = \sqrt{(-4-12)^2 + (8-12)^2}$$
$$= \sqrt{256+16}$$
$$= \sqrt{272}$$
$$= 4\sqrt{17}$$
$$DH = \sqrt{(-4-(-12))^2 + (8-16)^2}$$
$$= \sqrt{64+64}$$
$$= \sqrt{128}$$
$$= 8\sqrt{2}$$

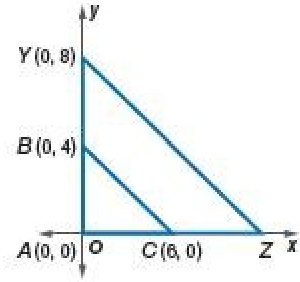
$\frac{JK}{DG} = \frac{KL}{GH} = \frac{JL}{DH} = \frac{1}{2}$, so $\Delta JKL \sim \Delta DGH$ by SSS Similarity.

ANSWER:



$\frac{JK}{DG} = \frac{KL}{GH} = \frac{JL}{DH} = \frac{1}{2}$, so $\Delta JKL \sim \Delta DGH$ by SSS Similarity.

If $\Delta ABC \sim \Delta AYZ$, find the missing coordinate.

18. 

SOLUTION:

Since $\Delta ABC \sim \Delta AYZ$, $\frac{AB}{AY} = \frac{AC}{AZ}$.

$AB = 4$, $AY = 8$, and $AC = 6$

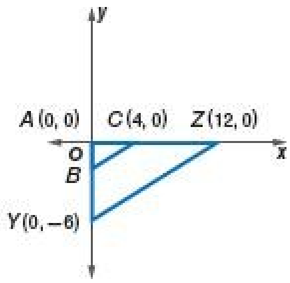
Substitute.

$$\frac{4}{8} = \frac{6}{AZ}$$
$$4AZ = 48$$
$$AZ = 12$$

The coordinates of Z are (12, 0) because the point Z lies on the right side of the x-axis, A lies on the origin, and $AZ = 12$.

ANSWER:

(12, 0)

19. 

SOLUTION:

Since $\Delta ABC \sim \Delta AYZ$, $\frac{AB}{AY} = \frac{AC}{AZ}$.
AZ = 12, *AY* = 6, and *AC* = 4
Substitute.

$$\frac{AB}{6} = \frac{4}{12}$$
$$12AB = 24$$
$$AB = 2$$

Since the point *B* lies below the y axis, the coordinates of *B* are (0, –2), *A* lies on the origin, and *AB* = 2.

ANSWER:

(0, –2)