Dilations

Name Key

State whether a dilation with the given scale factor is a reduction or an enlargement.

1. k = 3 Enlargement

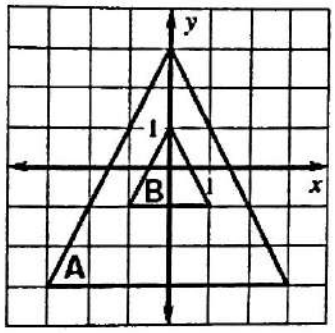
2. $k = \frac{1}{3}$ Reduction

3. $k = \frac{5}{4}$ Enlargement

4. k = 0.93 Reduction

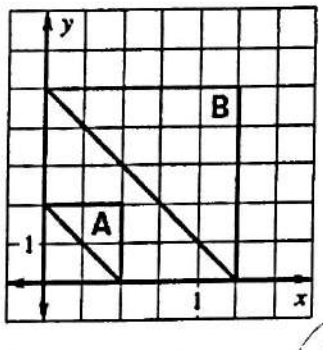
Determine whether the dilation from Figure A to Figure B is a *reduction* or an *enlargement*. Then find its scale factor.

5.



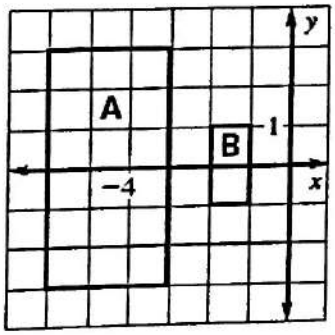
Reduction k = 2/6 = 1/3

6.



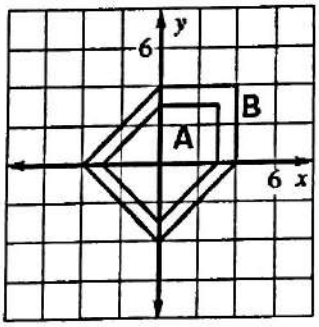
Enlargement k = 5/2

7.



Reduction k = 1/3

8.



Enlargement k = 2/1.5 = 4/3

Point A is a vertex of a polygon. Point R is the image of A after the dilation. Find the scale factor of the dilation.

9. A (3, 4) and R (9, 12)

$x = \frac{9}{3} = 3$

$y = 12/4$

10. A (9, 12) and R (6, 8)

$x = \frac{6}{9} = 2/3$

$y = \frac{8}{12}$

11. A (-2, -3) and R (-10, -15)

$x = \frac{-10}{-2} = 5$

$y = \frac{-15}{-3}$

A line segment has the given endpoints. Use the scale factor to write the ordered pairs after the dilation.

12. A(1,1), B (3, 1), and k = 2

A'(2,2) B'(6,2)

13. A(4,4), B(8, 12), and k = ¾

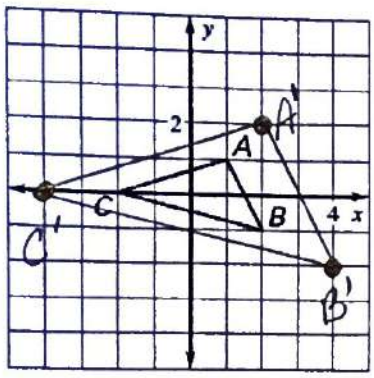
A'(3,3) B'(6,9)

14. A(0, 0), B(-3, 2), and k = 5

A'(0,0) B'(-15,10)

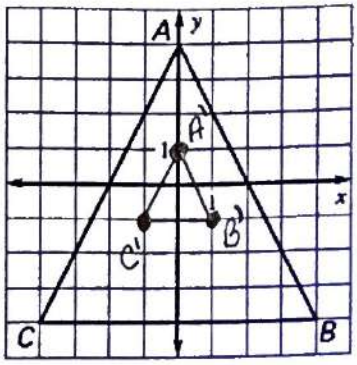
Draw a dilation of the figure using the given scale factor.

15. k = 2



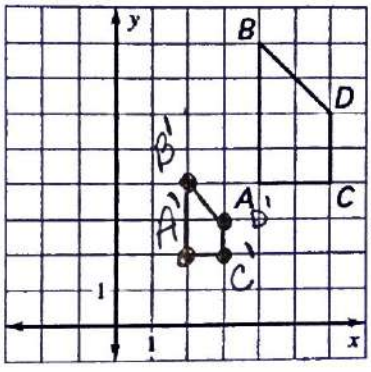
A (1,1) A'(2,2)
B(2,-1) B'(4,-2)
C(-2,0) C'(-4,0)

16. k = ¼



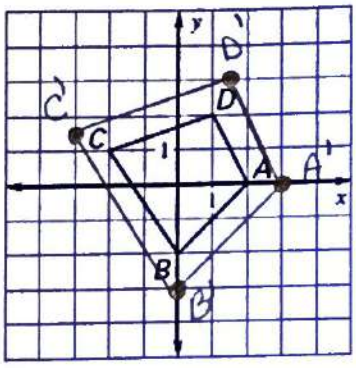
A(0,4) A'(0,1)
B(4,-4) B'(1,-1)
C(-4,-4) C'(-1,-1)

17. k = ½



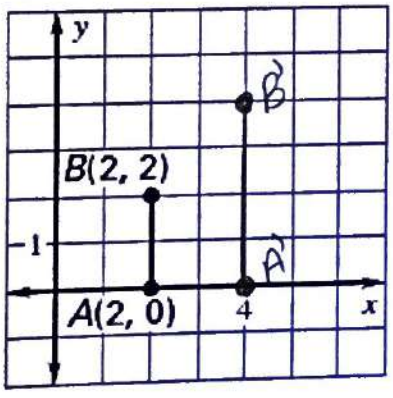
A(4,4) A'(2,2)
B(4,8) B'(2,4)
C(6,4) C'(3,2)
D(6,6) D'(3,3)

18. k = 1 ½



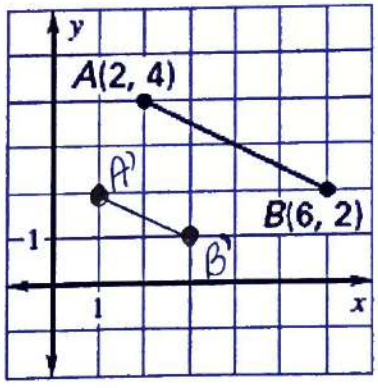
A(2,0) A'(3,0)
B(0,-2) B'(0,-3)
C(-2,1) C'(-3,1½)
D(1,2) D'(1½,3)

19. k = 2



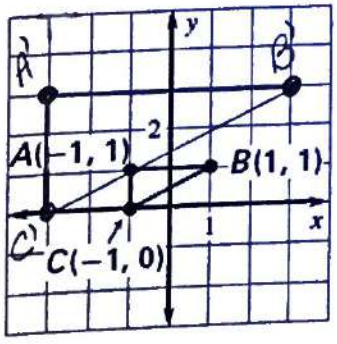
A(2,0) A'(4,0)
B(2,2) B'(4,4)

20. k = ½



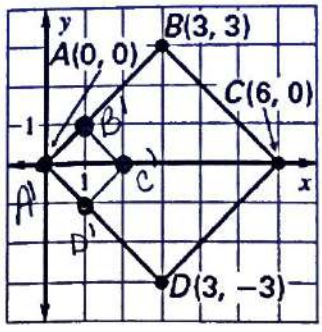
A(2,4) A'(1,2)
B(6,2) B'(3,1)

21. k = 3



A(-1,1) A'(-3,3)
B(1,1) B'(3,3)
C(-1,0) C'(-3,0)

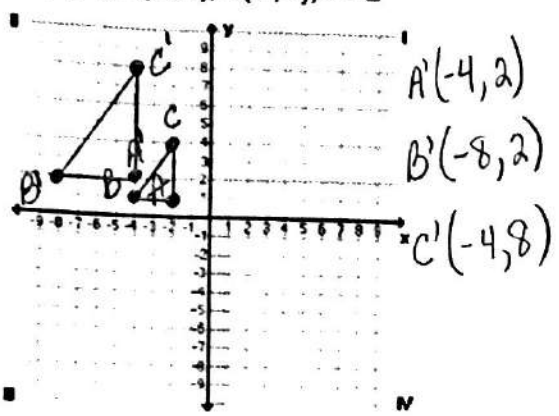
22. k = 1/3



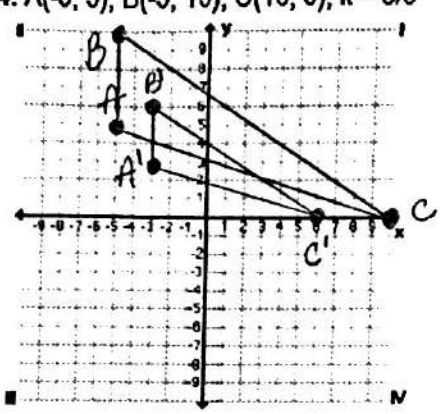
A(0,0) A'(0,0)
B(3,3) B'(1,1)
C(6,0) C'(2,0)
D(3,-3) D'(1,-1)

Draw a dilation of the polygon with the given vertices using the given scale factor. Plot the ordered pairs on the coordinate plane AND the dilation.

23. A(-2, 1), B(-4, 1), C(-2, 4); k = 2

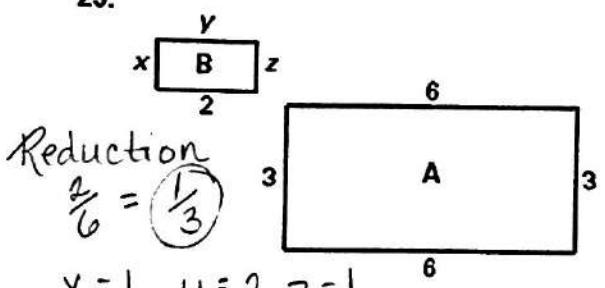


24. A(-5, 5), B(-5, 10), C(10, 0); k = 3/5



Determine whether the dilation from Figure A to Figure B is a reduction or an enlargement. Then, find the values of the variables.

25.

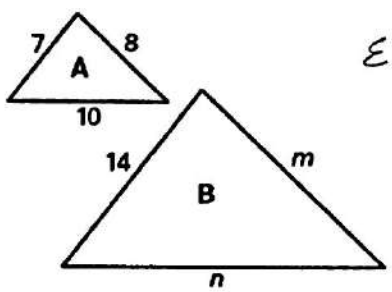


Reduction

$\frac{2}{6} = \frac{1}{3}$

x = 1, y = 2, z = 1

26.

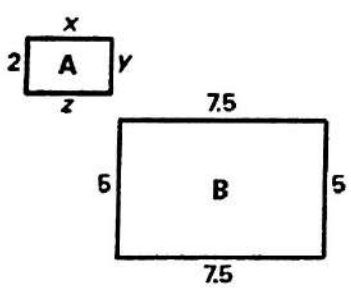


Enlargement

$\frac{14}{7} = 2$

m = 16, n = 20

27.

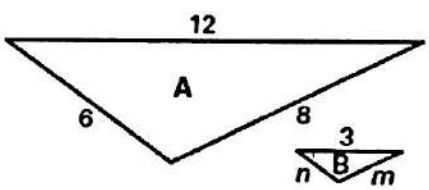


Enlargement

$\frac{5}{2}$

x = 3, y = 2, z = 3

28.

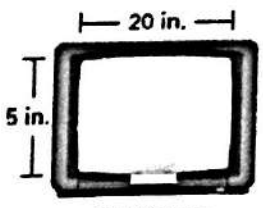


Reduction

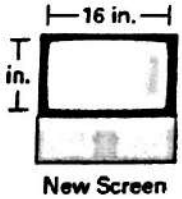
$\frac{3}{12} = \frac{1}{4}$

m = 2, n = 1.5

29. The screen on your old television is 20 inches wide and 15 inches high. The screen on your new widescreen television is 16 inches wide and 9 inches high. Is the screen on your new TV a dilation of the screen on your old TV? Explain.



Old Screen



New Screen

Top $\frac{16}{20} = \frac{4}{5}$

Side $\frac{9}{5}$

No, because corresponding side lengths are not proportional.