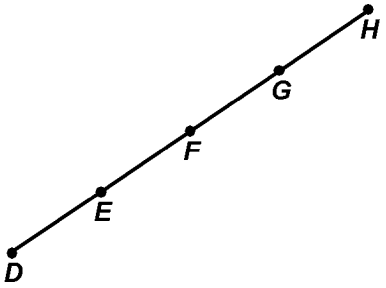
Name: _____

CC Geometry Honors

Dilations Practice

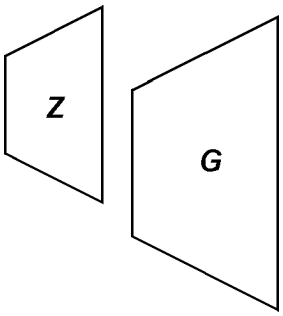
1) Line *FG* undergoes a dilation transformation with point *F* as the center and a scale factor of 2.



Which line is the image of line *FG*?

A) $\overline{FE}$
B) $\overline{FH}$
C) $\overline{FD}$
D) $\overline{GH}$

2) A dilation has been performed on one of these figures to create the other one. The scale factor is 1.5.



Which figure is the original and which is the image?

A) Figure *Z* is the original and figure *G* is its image.
B) Figure *G* is the original and figure *Z* is its image.
C) More information is needed.
D) Either figure could be the original and the other is its image.

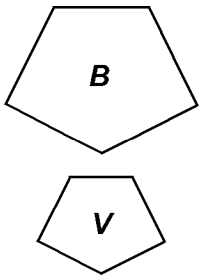
3) What is the *only* dilation scale factor that will produce an image congruent to the original?

A) 1
B) 2
C) 3
D) 0

4) Which mapping represents a dilation?

A) $(x,y) \rightarrow (-y,-x)$
B) $(x,y) \rightarrow (2x,2y)$
C) $(x,y) \rightarrow (x + 2,y + 2)$
D) $(x,y) \rightarrow (y,x)$

5) A dilation has been performed on one of these figures to create the other one.



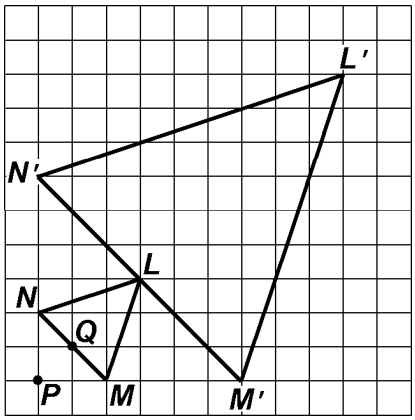
If the scale factor used is 0.66, which figure is the original and which is the image?

A) More information is needed.
B) Either figure could be the original and the other is its image.
C) Figure *V* is the original and figure *B* is its image.
D) Figure *B* is the original and figure *V* is its image.

6) In which quadrant would the image of point (5,-3) fall after a dilation using a factor of -3?

A) *I*
B) *II*
C) *III*
D) *IV*

7) In the diagram below, $\triangle LMN$ is the original figure and $\triangle L'M'N'$ is its image under a dilation transformation.



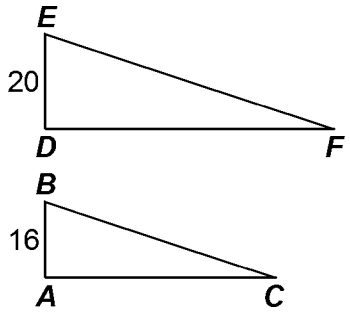
What is the scale factor of the dilation shown?

A) 4
B) 0.25
C) 0.33
D) 3

8) $\triangle CAT$ is the image of $\triangle DOG$ under a dilation of scale factor 6. Which one of the following statements is true?

A) $6(m\angle O) = m\angle A$
B) $CA = 6(DO)$
C) $m\angle O = 6(m\angle A)$
D) $6(CA) = DO$

9) In the accompanying diagram, $\triangle DEF$ is the image of $\triangle ABC$ after a dilation.



What is the scale factor of this dilation?

A) 8
B) 4
C) 1.25
D) 0.25

10) Which transformation represents a dilation?

A) $(8,4) \rightarrow (11,7)$
B) $(8,4) \rightarrow (4,2)$
C) $(8,4) \rightarrow (-4,-8)$
D) $(8,4) \rightarrow (-8,4)$

11) What are the coordinates of the point (2,-4) under the dilation D_{-2}?

A) (-4,8)
B) (8,-4)
C) (4,-8)
D) (-8,4)

12) Under a dilation where the center of dilation is the origin, the image of A(-2,-3) is A′(-6,-9). What are the coordinates of B′, image of B(4,0) under the same dilation?

A) (-12,0)
B) (-4,0)
C) (4,0)
D) (12,0)

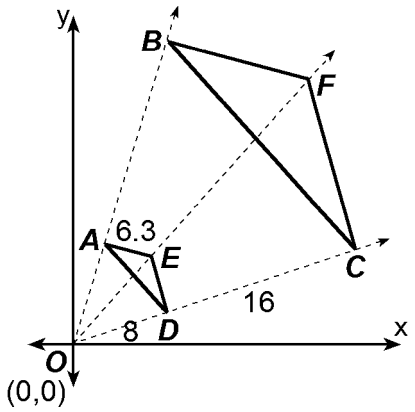
13) A triangle has coordinates A(-1,-2), B(-4,-2) and C(-4,-5). What are the coordinates of point A', the image of point A, under a dilation with a scale factor of 3?

A) (-12,-6)
B) (-6,-3)
C) (-3,-6)
D) (2,1)

14) Is the following transformation a dilation? [***Explain your answer***.]

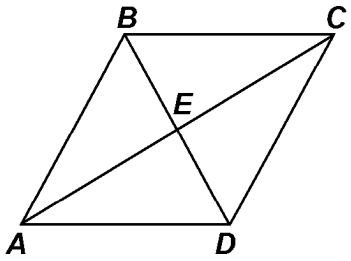
$A(0,4), B(3,3), C(0,5) \longrightarrow$
$A'(0,20), B'(15,15), C'(5,25)$

15) In the accompanying diagram, $\triangle BFC$ is the image of $\triangle AED$ under a dilation with center point O.



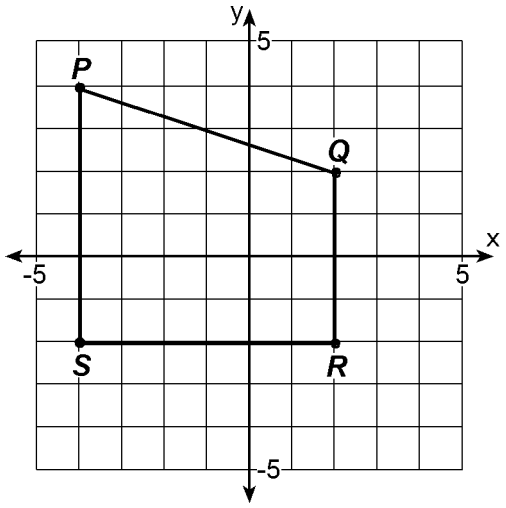
Find the length of side BF. [*Show all work and explain your answer.*]

16) In the accompanying diagram, rhombus $ABCD$ with diagonals $\overline{BD}$ and $\overline{AC}$ intersects at point E.
Side AD = 26 in. and the longer diagonal = 48 in.

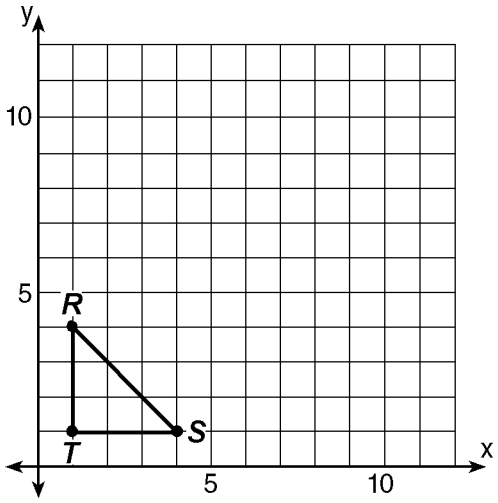


Find the length of the *shorter* diagonal of rhombus $A'B'C'D'$, the image of rhombus $ABCD$ after a dilation of scale factor 2.5. [*Show all work and explain your reasoning.*]

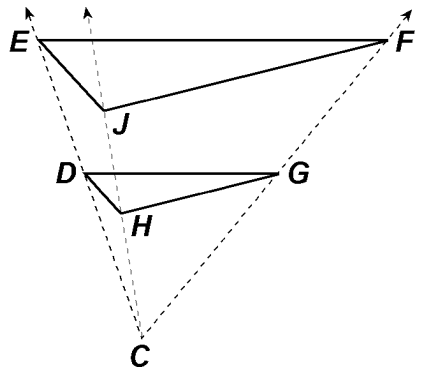
17) Dilate quadrilateral $PQRS$ with a scale factor of $\frac{1}{2}$. Use the origin for the center of dilation and label the image appropriately.



18) Dilate triangle RST with a scale factor = 3. Use point T as the center of dilation and label the image appropriately.



19) In the accompanying diagram, $\triangle JEF$ is the image of $\triangle HDG$ after a dilation with center at point C. The length of segment CG is 11.5, the length of DG is 10, and the length of EF is 16.

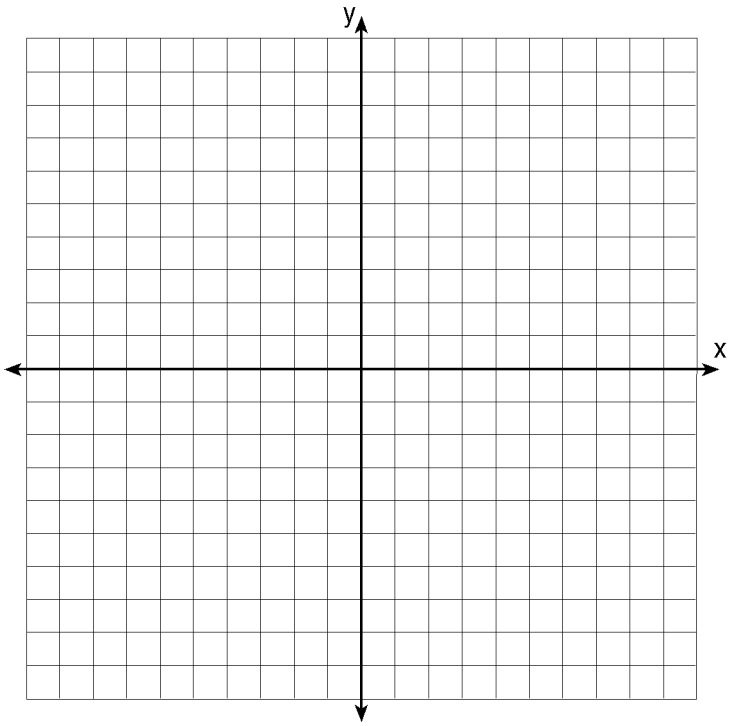


(**a**) What is the scale factor of the dilation? [*Show all work and explain your reasoning.*]

(**b**) What is the distance from point F to the center of dilation, point C? [*Show all work and explain your reasoning.*]

20) (**a**) On a set of coordinate axes, graph $\triangle ABC$ with coordinates $A(-1,2)$, $B(0,6)$, and $C(5,4)$.

(**b**) Graph $\triangle A'B'C'$, the image of $\triangle ABC$ after a dilation of 2.



1) B 2) A 3) A 4) B 5) D

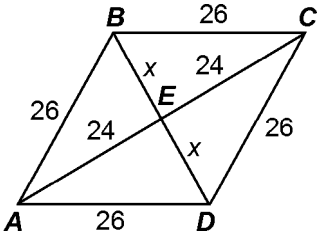
6) B 7) D 8) B 9) C 10) B

11) A 12) D 13) C

14) no
SAMPLE ANSWER. $C(0,5) \longrightarrow C'(5,25)$ is incorrect and should be $C(0,5) \longrightarrow C'(0,25)$.

15) 18.9
SAMPLE EXPLANATION: To find the ratio of the dilation factor, use the ratio of the distance from an image vertex (such as C) to point O divided by the distance from the corresponding pre-image's vertex (such as case D) to point O., So $\overline{CO}$:$\overline{DO}$, $CO = 8 + 16 = 24$ and $DO = 8$ (given); therefore, $CO:DO = 24:8 = 3$. The scale factor of the dilation is 3. Next, take the pre-image side AE, whose length is 6.3, and multiply it by the scale factor 3., $BF = 6.3 \times 3 = 18.9$

16) 50 in.
SAMPLE EXPLANATION:



Find the length of the shorter diagonal and dilate it by a scale factor of 2.5. Since the diagonals of a rhombus are perpendicular, the shorter diagonal can be found by using the Pythagorean Theorem. WORK SHOWN: $x^2 + b^2 = c^2$, $x^2 + \frac{1}{2}(48)^2 = (26)^2$, $x^2 + 576 = 676$, $x^2 = 676 - 576$, $x^2 = 100$, $x = 10$;
Since x is only half of the shorter diagonal, $BD = 10 \times 2 = 20$. Dilate $\overline{BD}$ by the scale factor, $BD = 20 \times 2.5 = 50$.

17) P' (-2,2), Q' (1,1), R'(1,-1), and S' (-2,-1)

18) R' (1,12), S' (12,1), and T' (1,1)

19) (a) The scale factor of any dilation can be computed by taking the ratio of the length of any side in the image and dividing it by the length of its corresponding side in the pre-image. The ratio of sides EF:$DG = 16:10$, $16 \div 10 = 1.6$;
(b) Dilations produce similar figures. The sides of the image and pre-image will be in proportion. The distance from F to C can be found by multiplying the distance $\overline{CG}$ by the dilation factor 1.6; $11.5 \times 1.6 = 18.4$

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