

Transformations Quiz

Math II

Name: _____

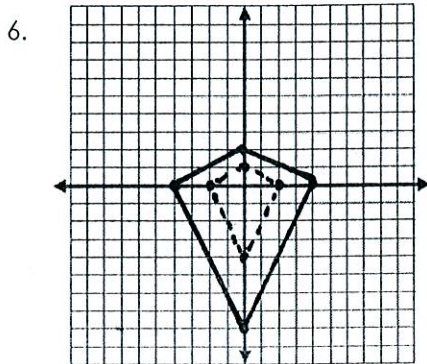
Score: _____ / 50

Answer questions #1-5 as true or false. If it is false, correct it to make it true.

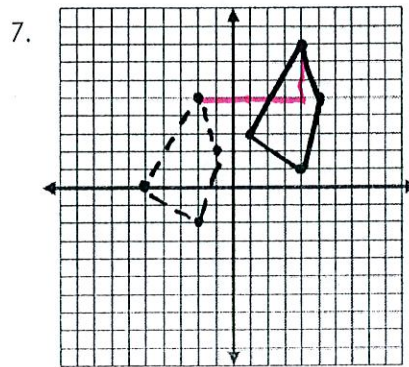
- Reflections, rotations, dilations, and translations are isometries.
- When reflecting over the line $y = x$, $(x, y) \rightarrow (y, x)$.
- When dilating a figure, a when $k > 1$ the figure is shrunk.
- When rotating a figure 180° clockwise, the rule is the same as rotating the figure 180° counterclockwise.
- Translations (slides) change the orientation of the image and pre-image.

- False, not dilations
- True
- False, it grows
- True
- False, they do not

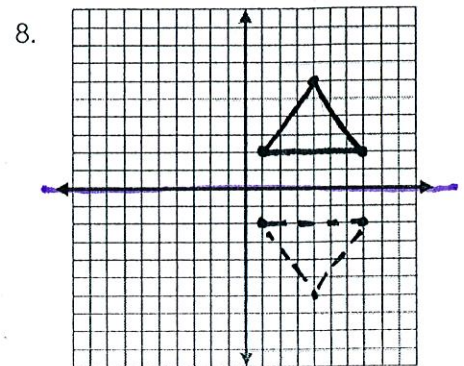
Given the pre-image and the image, describe the transformation in words and using coordinate notation.



Words: Dilation
 Rule: $(x, y) \rightarrow (2x, 2y)$



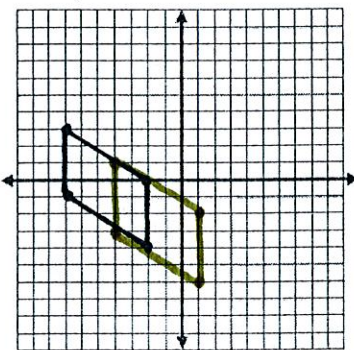
Words: Translation
 Rule: $(x, y) \rightarrow (x+6, y+3)$



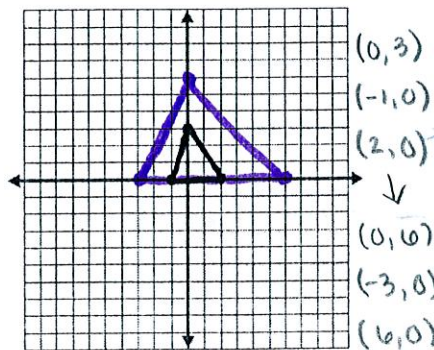
Words: Reflection over x-axis
 Rule: $(x, y) \rightarrow (x, -y)$

Transform the given graph according to the transformation given.

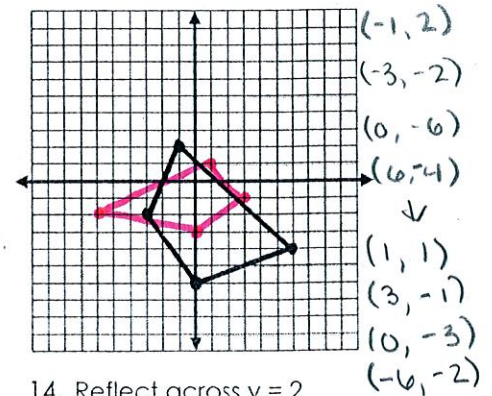
9. $(x, y) \rightarrow (x + 3, y - 2)$



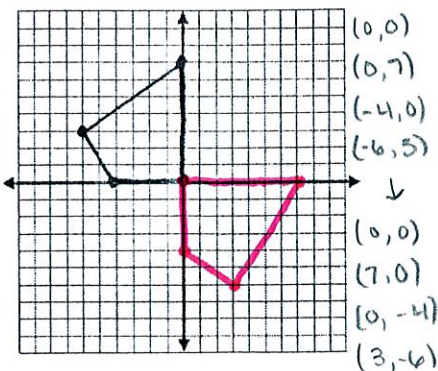
10. $(x, y) \rightarrow (3x, 2y)$



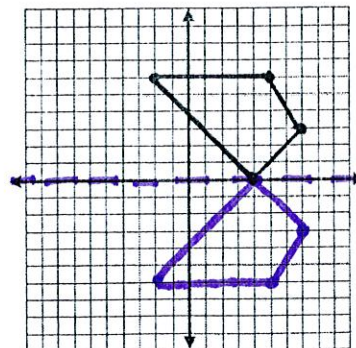
11. $(x, y) \rightarrow (-1x, \frac{1}{2}y)$



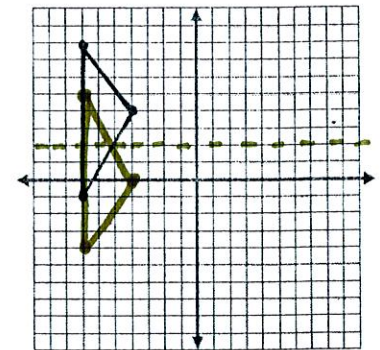
12. Reflect across $y = x$.



13. Reflect across the x-axis.

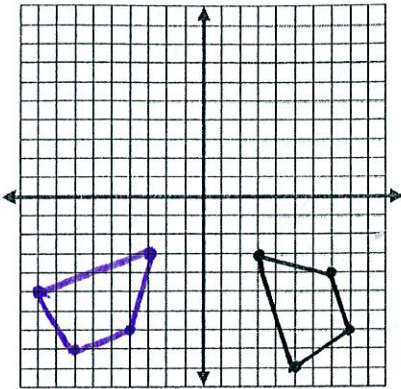


14. Reflect across $y = 2$

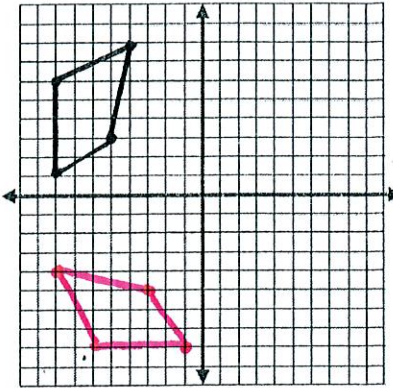


Transform the given graph according to the rotation given.

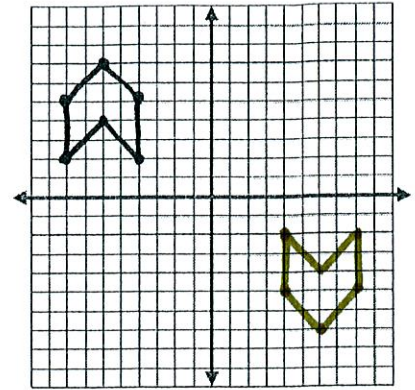
15. Rotate 90° clockwise



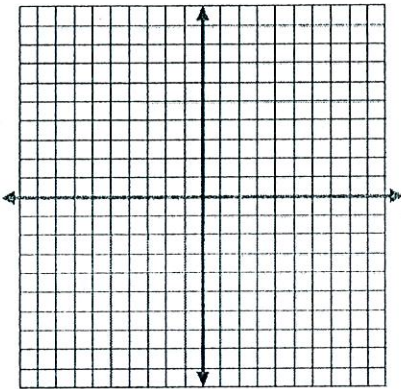
16. Rotate 270° clockwise



17. Rotate 180° counterclockwise



18. Given $\triangle ABC$, where $A(3, 4)$, $B(0, 0)$ and $C(-2, 6)$, state the final coordinates after a dilation by a scale factor of 2, a reflection across the y-axis, and a glide three units to the left and one unit down. (Use the graph below for help).

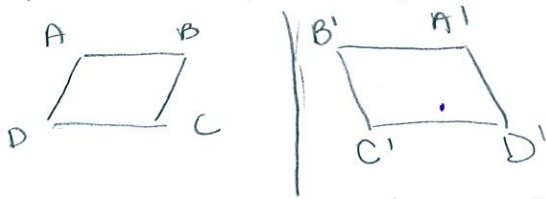


$$\begin{aligned} A(3, 4) &\rightarrow A'(6, 8) \rightarrow A''(-6, 8) \rightarrow A'''(-9, 7) \\ B(0, 0) &\rightarrow B'(0, 0) \rightarrow B''(0, 0) \rightarrow B'''(-3, -1) \\ C(-2, 6) &\rightarrow C'(-4, 12) \rightarrow C''(4, 12) \rightarrow C'''(1, 11) \end{aligned}$$

$$\begin{aligned} A''' &(-9, 7) \\ B''' &(-3, -1) \\ C''' &(1, 11) \end{aligned}$$

19. When a figure is reflected, do the image and pre-image have the same orientation? Explain in detail, why or why not. (Provide an example to show your reasoning. Pictures are OK.)

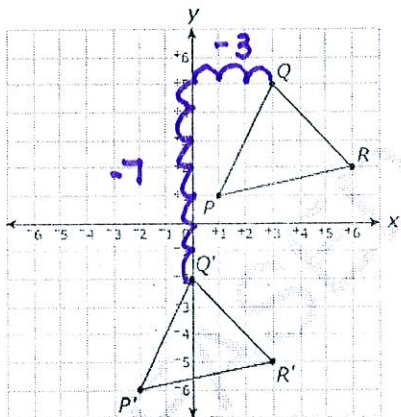
NO.



orientation refers to placement. originally, A was on the left but is now on the right.

EOC Prep: Answer the following multiple choice questions. Choose the best response.

20. In the graph below, $\triangle P'Q'R'$ is the image produced by applying a transformation to $\triangle PQR$.



Which transformation was used?

- A $(x', y') = (x - 3, y - 7)$
- B $(x', y') = (x + 3, y + 7)$
- C $(x', y') = (x - 7, y - 3)$
- D $(x', y') = (x + 7, y + 3)$

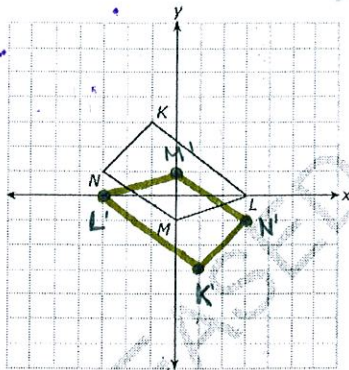
21. Point $P(-3, -1)$ is transformed using the rule $(x', y') = (x - 3, y + 1)$. The image P' is then rotated clockwise 90° about the origin, resulting in point P'' . What are the coordinates of P'' ?

- A $(-6, 0)$
 B $(0, -6)$
 C $(0, 6)$
 D $(6, 0)$

$$P'(-3-3, -1+1) = P'(-6, 0)$$

$$P''(y, -x) = P''(0, 6)$$

22. Quadrilateral KLMN will be rotated 180° about the origin.



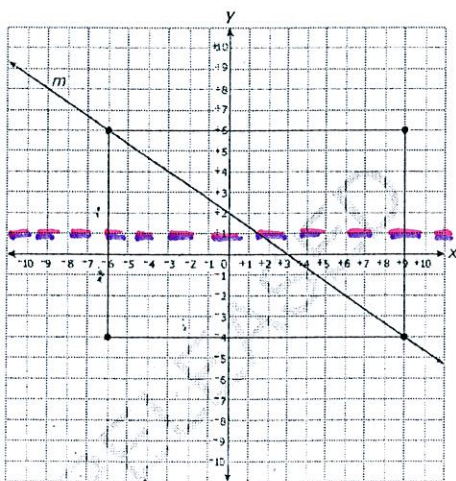
Which rule will describe the transformation?

- A $(x', y') = (x, y)$
 B $(x', y') = (-x, y)$
 C $(x', y') = (x, -y)$
 D $(x', y') = (-x, -y)$

23. $\triangle WXY$ has vertices $W(2, 5)$, $X(6, 2)$, and $Y(2, 2)$. If $\triangle WXY$ is dilated by a factor of $\frac{1}{2}$, what are the coordinates of X' in the transformed triangle?

- A $(1, 3)$
 B $(3, 1)$
 C $(4, 12)$
 D $(12, 4)$

24. Which transformation will carry the rectangle show below onto itself?



- A a reflection over line m
 B a reflection over the line $y = 1$
 C a rotation 90° counterclockwise about the origin
 D a rotation 270° counterclockwise about the origin

25. Which transformation will *always* produce a congruent figure?

- A $(x', y') = (x + 4, y - 3)$
 B $(x', y') = (2x, y)$
 C $(x', y') = (x + 2, 2y)$
 D $(x', y') = (4x, 4y)$

1. The number of centimeters y in a linear measurement varies directly with the number of inches x in the measurement. Pablo's height is 152.4 centimeters or 60 inches. What is Maria's height in centimeters if she is 64 inches tall?
2. The number of gallons g of fuel used on a trip varies directly with the number of miles m traveled. If a trip of 270 miles required 12 gallons of fuel, how many gallons are required for a trip of 400 miles?
3. Karen earns \$28.50 for working six hours. If the amount m she earns varies directly with h the number of hours she works, how much will she earn for working 10 hours?
4. The volume V of a gas kept at a constant temperature varies inversely as the pressure p . If the pressure is 24 pounds per square inch, the volume is 15 cubic feet. What will be the volume when the pressure is 30 pounds per square inch?
5. The time to complete a project varies inversely with the number of employees. If 3 people can complete the project in 7 days, how long will it take 5 people?
6. The number of revolutions made by a tire traveling over a fixed distance varies inversely to the radius of the tire. A 12-inch radius tire makes 100 revolutions to travel a certain distance. How many revolutions would a 16-inch radius tire require to travel the same distance?
7. For a fixed number of miles, the gas mileage of a car (miles/gallon) varies inversely with the number of gallons used. One year an employee driving a truck averaged 24 miles per gallon and used 750 gallons of gas. If the next year, to drive the same number of miles the employee drove a compact car averaging 39 miles per gallon, how many gallons of gas would be used? (The following are extensions and a mixture of the previous types.)
8. To build a sound wall along the highway, the amount of time t needed varies directly with the number of cement blocks c needed and inversely with the number of workers w . A sound wall made of 2400 blocks, using six workers takes 18 hours to complete. How long would it take to build a wall of 4500 blocks with 10 workers? HINT: $t = kc/w$
9. The weight of a person varies inversely as the square of the distance from the center of the earth. If the radius of the earth is 4000 miles, how much would a 180 pound person weigh, 2000 miles above the surface of the earth?
10. The strength of a rectangular beam varies jointly as its width and the square of its depth. If the strength of a beam three inches wide by 10 inches deep is 1200 pounds per square inch, what is the strength of a beam four inches wide and six inches deep?

1. $y = \text{centimeters}$ $y = xk$ $y = 64(2.54)$
 $x = \text{inches}$ $152.4 = 60k$ $y = 162.56 \text{ cm}$
 $k = 2.54$ Maria is 162.56 cm

2. $g = mk$ $12 = 270k$ $g = 400(2/45)$
 $k = \frac{2}{45}$ $g = 17.8 \text{ gal}$

3. $m = nk$ $28.5 = 6k$ $m = 10(4.75)$
 $k = 4.75$ $m = \$47.50$

4. $V = \frac{k}{p}$ $15 = \frac{k}{24}$ $k = 360$ $V = \frac{360}{20} = \underline{12 \text{ ft}^3}$

5. $t = \frac{k}{e}$ $7 = \frac{k}{3}$ $k = 21$ $t = \frac{21}{5} = 4.2$ $t = 4.2 \text{ days}$

6. $R = \frac{k}{\text{tire}}$ $100 = \frac{k}{12}$ $k = 1200$ $R = \frac{1200}{16}$ $R = 75 \text{ revolutions}$

7. $m = \frac{k}{g}$ $24 = \frac{k}{750}$ $k = 18000$ $39 = \frac{18000}{g}$ $g = \frac{18000}{39}$
gallons = 461.5

8. $t = \frac{ck}{w}$ $18 = \frac{2400k}{6}$ $108 = 2400k$ $t = \frac{4500(0.045)}{10}$ $t = 20.25 \text{ hours}$
 $k = 0.045$

$$9. \quad W = \frac{k}{d^2} \quad 180 = \frac{k}{(4000)^2} \quad k = 2880000000$$

$$\text{Distance} = 4000 + 2000$$

$$W = \frac{2880000000}{(6000)^2}$$

$$W = 80 \text{ lbs}$$

$$10. \quad S = wd^2k \quad 1200 = 3(10)^2k \quad S = 4(w)^2(4)$$

$$1200 = 3(100)k$$

$$S = 576 \text{ pounds}$$

$$1200 = 300k$$

$$k = 4$$