1. Use a translation rule to describe the translation of ABC that is 6 units to the right and 10 units down.
   - A. $T_{<6,\ -10}> (ABC)$
   - B. $T_{<6,\ 10}> (ABC)$
   - C. $T_{<6,\ -10}> (ABC)$
   - D. $T_{<6,\ 10}> (ABC)$

2. Use a translation rule to describe the translation of P that is 4 units to the left and 8 units down.
   - A. $T_{<4,\ -8}> (P)$
   - B. $T_{<4,\ 8}> (P)$
   - C. $T_{<4,\ -8}> (P)$
   - D. $T_{<4,\ 8}> (P)$

3. Write a rule in function notation to describe the transformation that is a reflection across the x-axis.
   - A. $R_y = x \left( x, y \right)$
   - B. $R_x = y \left( x, y \right)$
   - C. $R_x = 0 \left( x, y \right)$
   - D. $R_y = 0 \left( x, y \right)$

4. Find the image of P(0, -1) after two reflections; first $R_y = -2(P)$, and then $R_x = -5(P')$.
   - A. (-5, -4)
   - B. (-10, -5)
   - C. (-5, -3)
   - D. (0, -1)
5. Use the composition \((R_1 \circ r_{50, C})(ABC) = DEF\), shown below.

Which angle has an equal measure to \(m\angle B\)?

- A. \(m\angle D\)
- B. \(m\angle F\)
- C. \(m\angle A\)
- D. \(m\angle E\)

6. Use the composition \((R_1 \circ r_{50, C})(ABC) = DEF\), shown below.

Which side has an equal measure to \(\overline{BC}\)?

- A. \(\overline{DE}\)
- B. \(\overline{AB}\)
- C. \(\overline{EF}\)
- D. \(\overline{DF}\)
7 Use the figures below.

Write a sequence of rigid motions that maps $RST$ to $DEF$.

- $A: \ (RST \circ r_{270^\circ, P})(RST) = (DBF)$
- $B: \ r_{180^\circ, P}(RST) = (DBF)$
- $C: \ (R_y = -x \circ r_{180^\circ, P})(RST) = (DBF)$
- $D: \ R_y = x(RST) = (DBF)$

8 Use the figures below.

Write a sequence of rigid motions that maps $\overline{AB}$ to $\overline{XY}$.

- $A: \ (T_{-2, -2} \circ r_{90^\circ, P})(\overline{AB}) = (\overline{XY})$
- $B: \ (R_y = -x \circ r_{90^\circ, P})(\overline{AB}) = (\overline{XY})$
- $C: \ R_y = 0(\overline{AB}) = (\overline{XY})$
- $D: \ (T_{0, -1} \circ r_{90^\circ, P})(\overline{AB}) = (\overline{XY})$
9. In the diagram, $ABC \cong LMN$. What is a congruence transformation that maps $ABC$ onto $LMN$?

A. $(R_y = -x, T_{<0, 2>})(ABC) \cong (LMN)$
B. $(R_y = -x)(ABC) \cong (LMN)$
C. $(R_y = x, T_{<0, -2>})(ABC) \cong (LMN)$
D. $(R(90^\circ, O), R_y = -2)(ABC) \cong (LMN)$

10. Which figures are congruent?

A. $B \cong D$
B. $B \cong D$ and $E \cong F$
C. $B \cong D$ and $E \cong F$ and $A \cong C$
D. $B \cong D$ and $A \cong C$
11. The dashed-lined figure is a dilation image of $EFGH$. Is $D_{(n, 0)}$ an enlargement or a reduction? What is the scale factor $n$ of the dilation?

- A. $n = 3$; enlargement
- B. $n = 6$; enlargement
- C. $n = \frac{1}{3}$; reduction
- D. $n = 3$; reduction

12. The dashed-lined figure is a dilation image of $ABC$ with center of dilation $P$ (not shown). Is $D_{(n, P)}$ an enlargement, or a reduction? What is the scale factor $n$ of the dilation?

- A. reduction; $n = \frac{1}{2}$
- B. reduction; $n = \frac{1}{4}$
- C. reduction; $n = 2$
- D. enlargement; $n = 2$
13 The dashed triangle is a dilation image of the solid triangle. What is the scale factor?

A \( \frac{1}{4} \)
B \( \frac{1}{2} \)
C \( \frac{2}{3} \)
D 2

14 The zoom feature on a camera lens allows you dilate what appears on the display. When you change from 100% to 800%, the new image on your screen is an enlargement of the previous image with a scale factor of 8. If the new image is 56 millimeters wide, what was the width of the previous image?

A 448 millimeters
B 28 millimeters
C 224 millimeters
D 7 millimeters
15. What composition of rigid motions and a dilation maps $EFGH$ to the dashed figure?

A. $D_{\frac{1}{3}}(2, -2) \circ T_{<4,1>}$
B. $D_{\frac{1}{3}}(2, -2) \circ T_{<-4,1>}$
C. $D_{(3,2)}(2, -2) \circ T_{<-4,1>}$
D. $D_{(3,2)}(2, -2) \circ T_{<4,1>}$

16. What composition of rigid motions and a dilation maps $EFGH$ to the dashed figure?

A. $D_2 \circ T_{<0,-6>}$
B. $D_2 \circ T_{<1,-3>}$
C. $D_{\frac{1}{2}} \circ T_{<1,-3>}$
D. $D_{\frac{1}{2}} \circ T_{<0,-6>}$
17 A blueprint for a house has a scale factor $n = 45$. A wall in the blueprint is 8 in. What is the length of the actual wall?

A 360 ft  
B 4,320 ft  
C 30 in.  
D 30 ft

18 Which figures appear to be similar?

A $B \sim D$ and $E \sim F$  
B $B \sim D$ and $E \sim F$ and $A \sim C$  
C $B \sim D$ and $A \sim C$  
D $A \sim C$

19 What are the vertices of the image of $\overline{YZ}$ after a dilation whose scale factor is $\frac{4}{5}$ and whose center is $Z$?

A $Z'(8, 4)$ and $Y'(0, 4)$  
B $Z'(4, 2)$ and $Y'(-2, -1)$  
C $Z'(4, 2)$ and $Y'(1, 2)$  
D $Z'(8, 4)$ and $Y'(0, -4.5)$
20 Is there a similarity transformation that maps $ABC$ to $DEF$? If so, identify the similarity transformation and write a similarity statement. Explain your answer.

Yes; we can find a scale factor $k$ such that $k\overline{AB} = \overline{DE}$, $k\overline{BC} = \overline{EF}$, and $k\overline{CA} = \overline{FD}$. In the figure, $k = 4$. Dilate $ABC$ by the factor 4 to get $A'B'C'$. Since $A'B'C' \approx DEF$ by AA, there is a rigid motion that maps $A'B'C'$ onto $DEF$. So a dilation followed by a rigid motion maps $ABC$ onto $DEF$.

No; there is no scale factor $k$ such that $k\overline{AB} = \overline{DE}$, $k\overline{BC} = \overline{EF}$, and $k\overline{CA} = \overline{FD}$.

No; although there is a scale factor $k = 2$ such that $k\overline{AB} = \overline{DE}$, $k\overline{BC} = \overline{EF}$, and $k\overline{CA} = \overline{FD}$, there is no rigid motion that maps $A'B'C'$ onto $DEF$.

Yes; we can find a scale factor $k$ such that $k\overline{AB} = \overline{DE}$, $k\overline{BC} = \overline{EF}$, and $k\overline{CA} = \overline{FD}$. In the figure, $k = 2$. Dilate $ABC$ by the factor 2 to get $A'B'C'$. Since $A'B'C' \approx DEF$ by SSS, there is a rigid motion that maps $A'B'C'$ onto $DEF$. So a dilation followed by a rigid motion maps $ABC$ onto $DEF$.