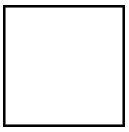
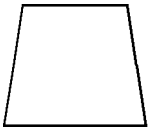
Name: _____

CC Geometry

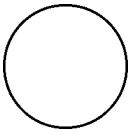
Unit 2 Test Review
Transformations, Rigid Motions and Congruence

1) Which figure does *not* have line symmetry?

A) 

B) 

C) 

D) 

2) What is the image of A(3,4) under $R_{90°}$?

A) (-4,3)
B) (-3,-4)
C) (-4,-3)
D) (3,-4)

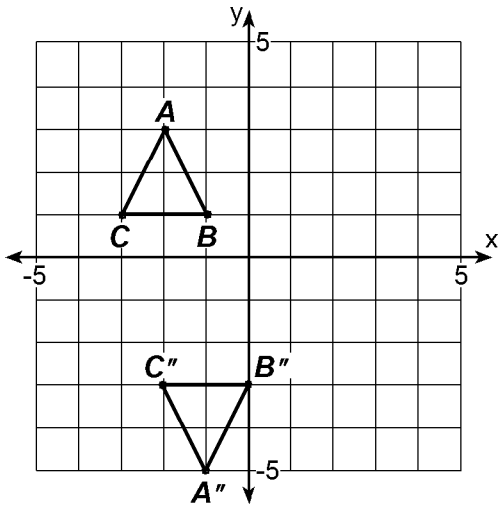
3) What is the image of the point (-3,-1) under the translation that shifts (x,y) to $(x - 2, y + 4)$?

A) (-1,-5)
B) (-5,3)
C) (-5,-5)
D) (-1,3)

4) Which rotation about the origin is equivalent to $R_{-200°}$?

A) $R_{-160°}$
B) $R_{200°}$
C) $R_{160°}$
D) $R_{560°}$

5) Refer to the diagram below.



What two transformations took triangle ABC to triangle $A''B''C''$?

A) a rotation of 180° about the origin followed by a translation of (-2,-3)
B) a translation of (1,-2) followed by a reflection over the x-axis
C) a translation of (1,-3) followed by a rotation of 180° about point A
D) a reflection over the x-axis followed by a translation of (1,-2)

6) Which figure has 60° rotational symmetry?

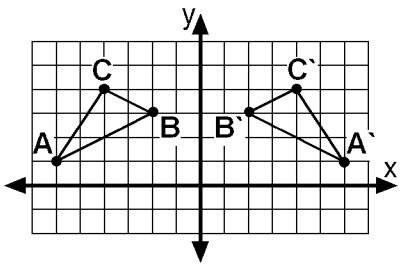
A) regular hexagon
B) square
C) equilateral triangle
D) regular octagon

7) Which letter has point symmetry?

A) T C) C

B) H D) E

8) In the accompanying diagram, $\Delta A'B'C'$ is the image of ΔABC.



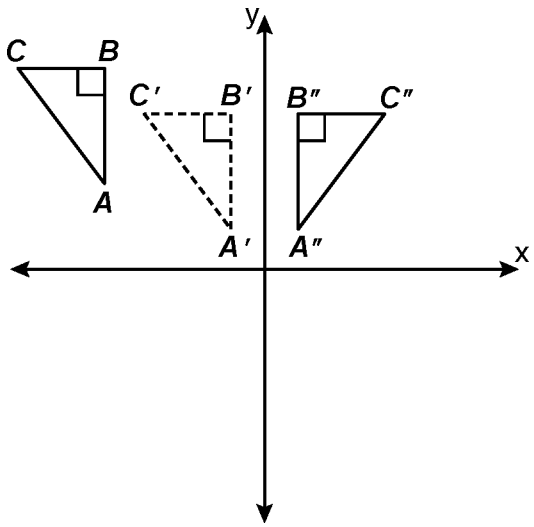
Which type of transformation is shown in the illustration?

A) dilation
B) rotation
C) line reflection
D) translation

9) If $\Delta JKL \cong \Delta MNO$, which statement is always true?

A) $\angle KJL \cong \angle MON$
B) $\overline{JK} \cong \overline{ON}$
C) $\angle KLJ \cong \angle NMO$
D) $\overline{JL} \cong \overline{MO}$

10) In the diagram below, $\Delta A'B'C'$ is a transformation of ΔABC, and $\Delta A''B''C''$ is a transformation of $\Delta A'B'C'$.



The composite transformation of ΔABC to $\Delta A''B''C''$ is an example of a

A) translation followed by a reflection
B) reflection followed by a rotation
C) reflection followed by a translation
D) translation followed by a rotation

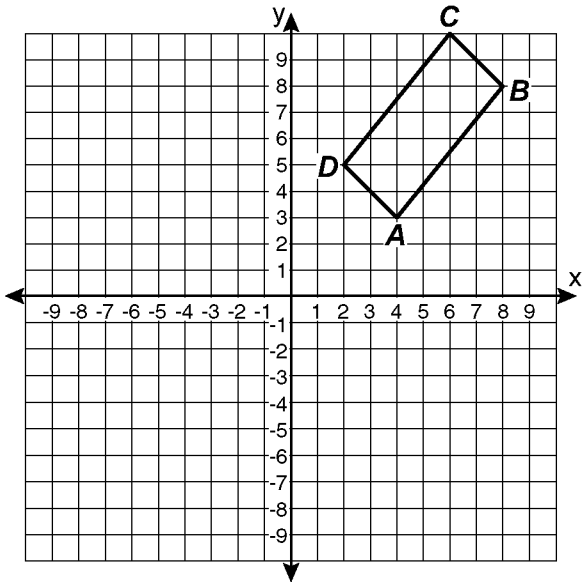
11) Which figure has 120° rotational symmetry?

A) rhombus
B) equilateral triangle
C) regular pentagon
D) square

12) The image of A(-1,3) under the translation $T_{2,1}$ is

A) (-3,2) C) (1,4)
B) (0,5) D) (-2,3)

13) The rectangle *ABCD* shown in the diagram below will be reflected across the x-axis.



What will *not* be preserved?

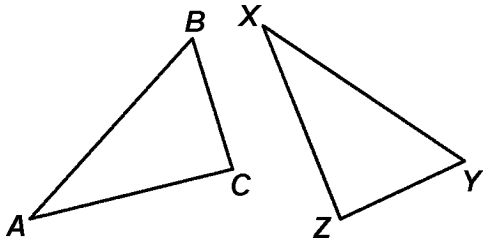
A) measure of $\angle A$

B) parallelism of $\overline{AB}$ and $\overline{CD}$

C) length of $\overline{AB}$

D) slope of $\overline{AB}$

14) In the diagram below, $\triangle ABC \cong \triangle XYZ$.



Which two statements identify corresponding congruent parts for these triangles?

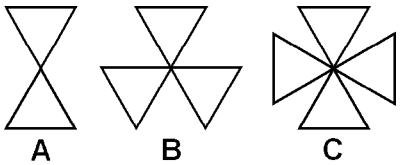
A) $\overline{BC} \cong \overline{YZ}$ and $\angle A \cong \angle X$

B) $\overline{AB} \cong \overline{XY}$ and $\angle C \cong \angle Y$

C) $\overline{AB} \cong \overline{YZ}$ and $\angle C \cong \angle X$

D) $\overline{BC} \cong \overline{XY}$ and $\angle A \cong \angle Y$

15) Which figures have *both* point symmetry and line symmetry?



A) none of the figures

B) *B* and *C*, only

C) all of the figures

D) *A* and *C*, only

16) Pentagon *PQRST* has $\overline{PQ}$ parallel to $\overline{TS}$. After a translation of $T_{2,-5}$, which line segment is parallel to $\overline{P'Q'}$?

A) $\overline{T'S'}$

B) $\overline{R'S'}$

C) $\overline{T'P'}$

D) $\overline{R'Q'}$

17) Which polygon has rotational symmetry of 90°?

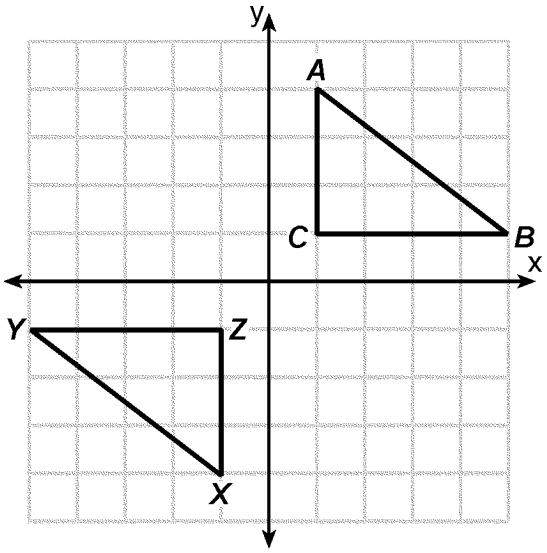
A) regular pentagon
B) equilateral triangle
C) regular hexagon
D) square

18) Under a translation, the image of point (3,2) is (-1,3). What are the coordinates of the image of point (-2,6) under the same translation?

19) After a reflection over a line, $\Delta A'B'C'$ is the image of ΔABC. Explain why triangle ABC is congruent to triangle $A'B'C'$.

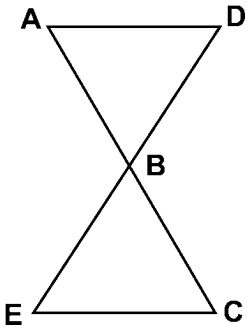
20) A regular hexagon is rotated in a counterclockwise direction about its center. Determine and state the minimum number of degrees in the rotation such that the hexagon will coincide with itself. [*Show all work.*]

21) In the diagram below, ΔABC and ΔXYZ are graphed.



Use the properties of rigid motions to explain why $\Delta ABC \cong \Delta XYZ$.

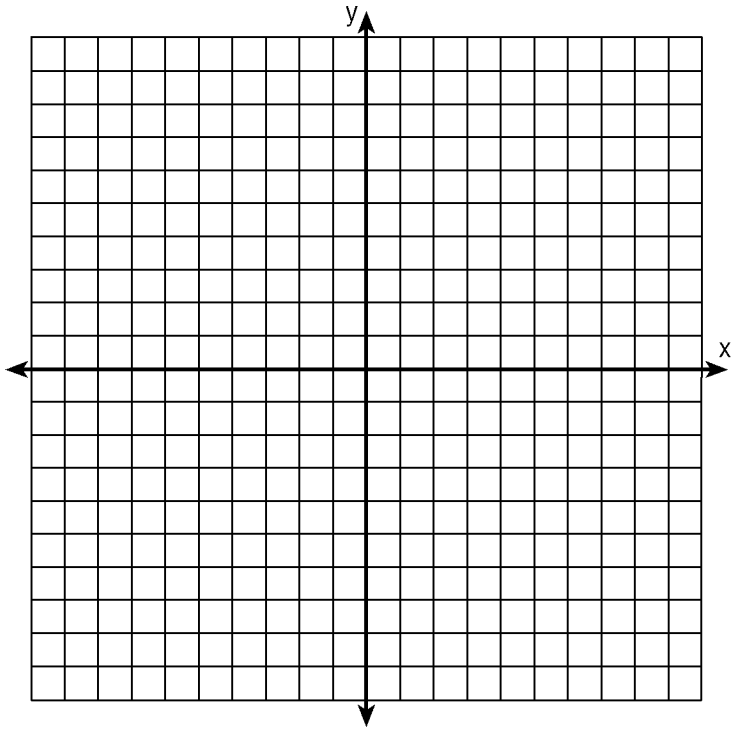
22) In the accompanying diagram, $\overline{AC}$ and $\overline{DE}$ bisect each other at B.



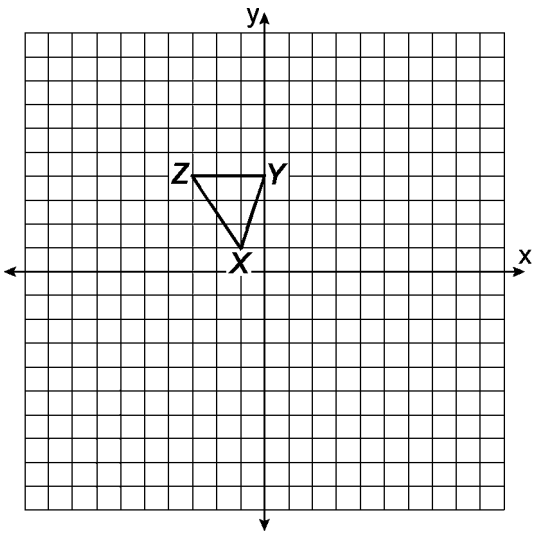
Prove that $\Delta ABD \cong \Delta CBE$ using transformation geometry axioms and isometry properties.

23) Triangle *TAP* has coordinates *T*(-1,4), *A*(2,4), and *P*(2,0).

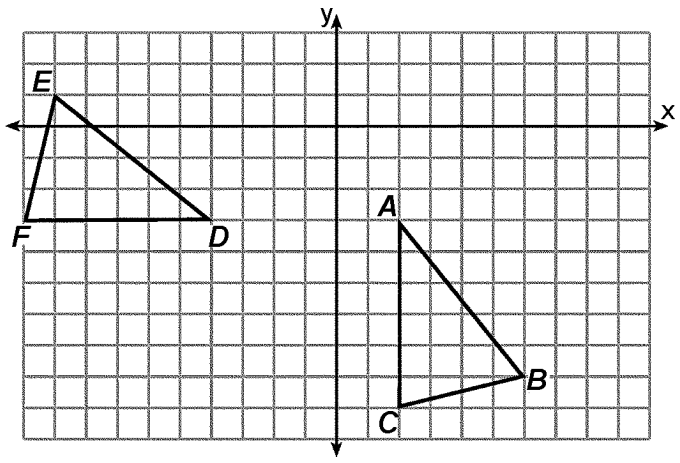
On the set of axes below, graph and label $\Delta T'A'P'$, the image of ΔTAP after the translation $(x,y) \rightarrow (x - 5, y - 1)$.



24) Triangle *XYZ*, shown in the diagram below, is reflected over the line $x = 2$. State the coordinates of $\Delta X'Y'Z'$, the image of ΔXYZ.



25) The grid below shows ΔABC and ΔDEF.



(**a**) Let $\Delta A'B'C'$ be the image of ΔABC after a rotation about point *A*. Determine and state the location of B' if the location of point C' is (8,3). [*Explain your answer.*]

(**b**) Is ΔDEF congruent to $\Delta A'B'C'$? [*Explain your answer.*]

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

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

11) B 12) C 13) D 14) A 15) D

16) A 17) D

18) (-6,7)

19) SAMPLE EXPLANATION: Reflections are rigid motions, and during rigid motions, distances remain the same. So, $\overline{AB} \cong \overline{A'B'}$ and $\overline{BC} \cong \overline{B'C'}$ and $\overline{AC} \cong \overline{A'C'}$. The triangles are congruent by SSS.

20) 60°

WORK SHOWN: $\frac{360}{6} = 60$

21) SAMPLE EXPLANATION: $\triangle XYZ$ is the image of $\triangle ABC$ after a rotation of 180° about the origin. In any rotation, distance is preserved because rotation is a rigid motion. Thus, the triangles are congruent.

22) Answer is a proof.

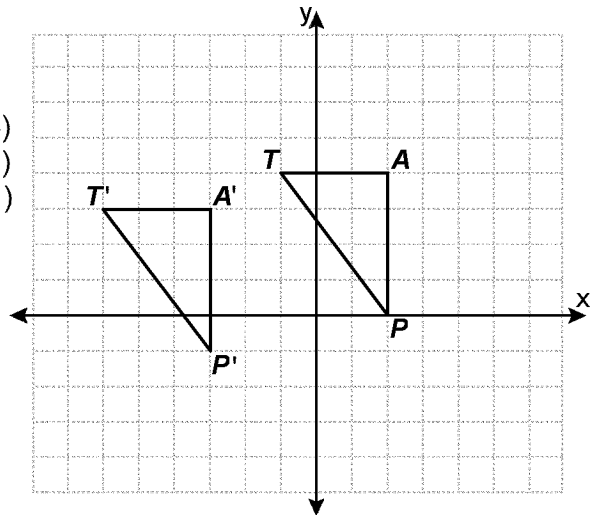
23)

$(x,y) \rightarrow (x-5, y-1)$

$T(-1,4) \longrightarrow T'(-6, 3)$

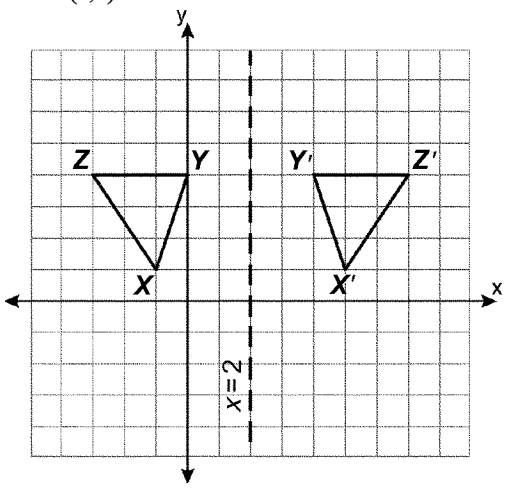
$A(2,4) \longrightarrow A'(-3, 3)$

$P(2,0) \longrightarrow P'(-3,-1)$



24) X' (5,1), Y' (4,4), and Z' (7,4)

WORK SHOWN:



25) (a) B' (7,1)

SAMPLE EXPLANATION: The angle of rotation that took C to C' was 90° counter-clockwise. So the angle of rotation that takes B to B' is also 90°. The slope of $\overline{AB} = -\frac{5}{4}$. The slope of $\overline{AB'}$ (the line perpendicular to $\overline{AB}$) $= \frac{4}{5}$. So the coordinate of B' is $(5 + 2, 4 - 3) = (7,1)$;

(b) Yes

SAMPLE EXPLANATION: When $\triangle A'B'C'$ is reflected over the line x = -1, it will map the $\triangle DEF$. Since a reflection is a rigid motion, distance is preserved. Therefore, $\triangle DEF \cong \triangle A'B'C'$ by SSS.