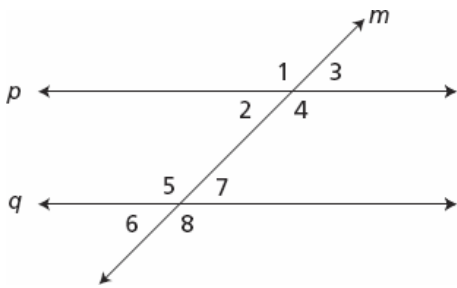1. In the figure below, $p \parallel q$. Which of the statements is NOT true?
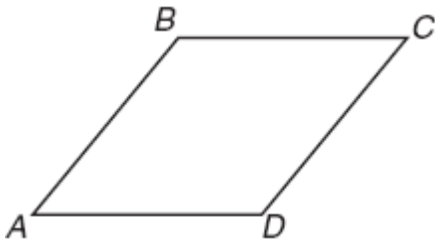

(A) $m\angle 1 = m\angle 4$

(B) $m\angle 6 = m\angle 2$

(C) $m\angle 6 + m\angle 3 = 180°$

(D) $m\angle 2 + m\angle 5 = 180°$

2. Look at parallelogram $ABCD$ below. How could you prove that $ABCD$ is a rhombus?

(A) Show that the diagonals are perpendicular.

(B) Show that the diagonals are congruent.

(C) Show that both pairs of opposite angles are congruent.

(D) Show that two pairs of opposite sides are congruent.

3. Given: $\overline{BD}$ and $\overline{AE}$ intersect at point C, point C is the midpoint of $\overline{BD}$, point C is the midpoint of $\overline{AE}$.
   Which cannot be used to prove $\triangle ABC \cong \triangle EDC$?
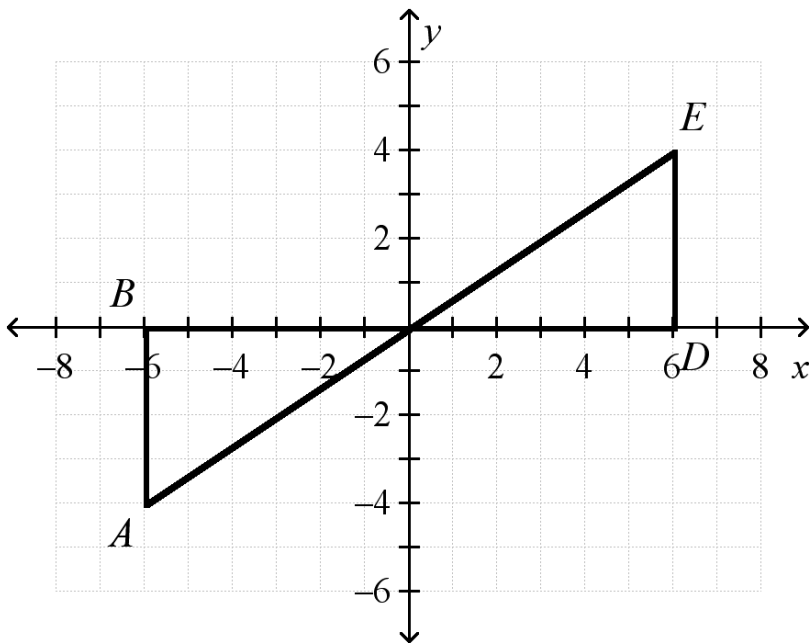

(A) ASA

(B) SSS

(C) SAS

(D) AAA

4. If there are three distinct collinear points A, B, C and $AB + BC = AC$, which of these statements must be true? Select all that apply.

Ⓐ $\overline{AB} \cong \overline{BC}$

Ⓑ B is between A and C.

Ⓒ A, B, and C are coplanar.

Ⓓ B is the midpoint of $\overline{AC}$.

Ⓔ $\angle ABC$ is a right angle.

5. What transformations were used to get from the triangle on the left (blue) to the triangle on the right (green)? Enter the letters that apply from the box on the right.

Are the triangles congruent? Choose the letter for the correct answer.
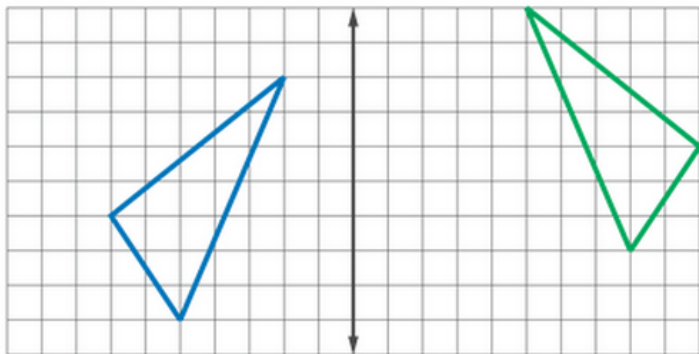
a.	dilation
b.	reflection
c.	rotation
d.	translation
e.	no
f.	yes

6. Enter the correct number of ways that each shape can be reflected across an axis of symmetry so that is carries onto itself. Then enter the least number of degrees that each shape can be rotated so that it carries onto itself.
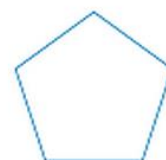
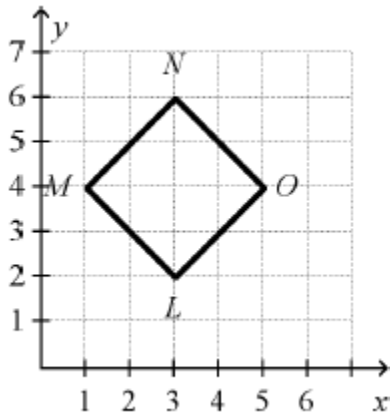rectangle   parallelogram   trapezoid   regular pentagon

Reflections:

Rotations:

7. Quadrilateral *LMNO* has vertices as shown below. Each side has a length of $2\sqrt{2}$ units. Which would be sufficient to prove that *LMNO* is a square?

(A) $\overline{MN}$ and $\overline{LO}$ have the same slope.

(B) $\overline{MO}$ bisects $\overline{LN}$.

(C) The product of the slopes of $\overline{MO}$ and $\overline{LN}$ is -1.

(D) The product of the slopes of $\overline{MN}$ and $\overline{LM}$ is -1.

8. Use the following information for the proof to determine the missing reason for statement number 6.

Given: $\overrightarrow{MO}$ bisects $\angle PMN$ and $\overrightarrow{OM}$ bisects $\angle PON$
Prove: $\triangle PMO \cong \triangle NMO$
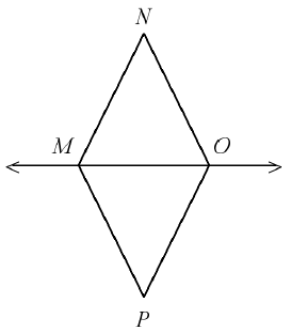
Statements	Reasons
1. $\overrightarrow{MO}$ bisects $\angle PMN$.	1. Given
2. $\angle PMO \cong \angle NMO$	2. Definition of angle bisector
3. $\overline{MO} \cong \overline{MO}$	3. Reflexive Property of Congruence
4. $\overrightarrow{OM}$ bisects $\angle PON$.	4. Given
5. $\angle POM \cong \angle NOM$	5. Definition of angle bisector
6. $\triangle PMO \cong \triangle NMO$	6. __?__

(A) ASA Postulate

(B) AA Postulate

(C) AAS Theorem

(D) SAS Postulate

9. What other information is needed in order to prove the triangles congruent using the SAS Congruence Postulate?

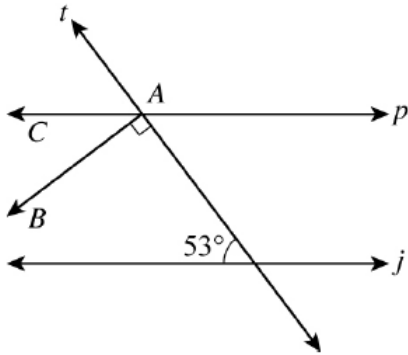(A) $\angle BAC \cong \angle DAC$

(B) $\overline{AC} \perp \overline{BD}$

(C) $\overline{AB} \parallel \overline{AD}$

(D) $\overline{AC} \parallel \overline{BD}$

10. Quadrilateral *RSTU* has vertices *R*(–6, –3), *S*(3, 3), and *T*(4, –1). What are the coordinates of vertex *U* if *RSTU* is a parallelogram?

$$U(\quad\quad,\quad\quad)$$

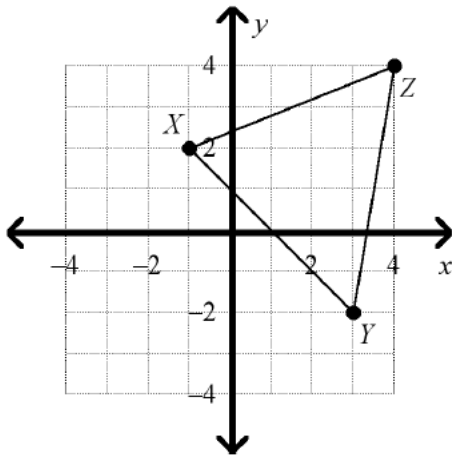11. Given that $p \parallel j$, and $t \perp \overrightarrow{AB}$, what is the measure of $\angle BAC$?

Ⓐ 37⁰

Ⓒ 90⁰

Ⓑ 53⁰

Ⓓ 127⁰

12. If triangle *XYZ* is rotated 90° clockwise about the origin to form triangle *X'Y'Z'*, what are the coordinates of *Y'* ?

Ⓐ $(2,-3)$

Ⓒ $(-2,-3)$

Ⓑ $(-2,3)$

Ⓓ $(-3,-2)$

13. What is the center and radius of the circle with equation $(x + 2)^2 + (y + 10)^2 = 25$?
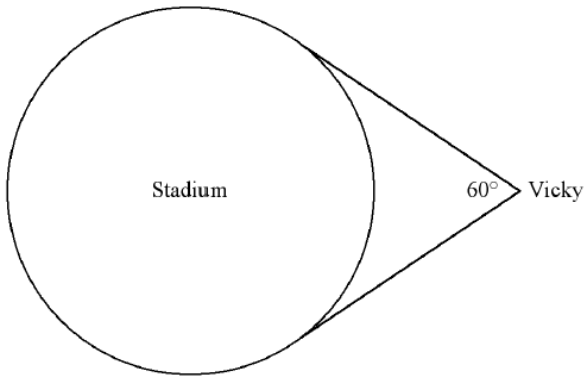
Ⓐ Center $(-2,-10); r = 5$

Ⓒ Center $(-2,-10); r = 10$

Ⓑ Center $(2,\ 10); r = 5$

Ⓓ Center $(10,\ 2); r = 25$

14. Vicky looked at the outside of a circular stadium with binoculars. She estimated the angle of her vision was reduced to 60°. She is positioned so that the line of site on either side is tangent to the stadium. What was the measure of the arc of the stadium intercepted by the lines of site?
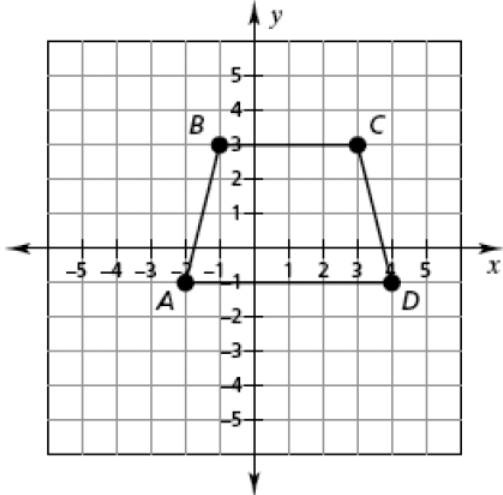
Stadium   60° Vicky

(A)   60°   (C)   120°

(B)   80°   (D)   160°

15. In triangle ABC shown below, $\overline{PQ} \parallel \overline{BC}$. What is the length of $\overline{PB}$ in centimeters?

A
5 cm   6 cm
P   Q
24 cm
B   C
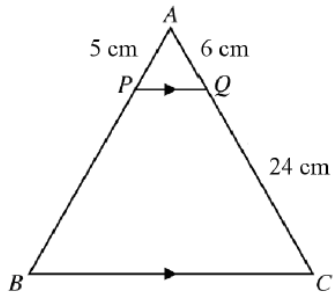
(A)   10 cm   (C)   20 cm

(B)   12 cm   (D)   30 cm

16. Which of the following would you NOT use to prove that quadrilateral $ABCD$ is an isosceles trapezoid?

(A)   The distance from A to B is equal to the distance from C to D.

(B)   The slope of $\overline{BC}$ is equal to the slope of $\overline{AD}$.

(C)   The equation $m\angle B + m\angle C = 180$.

(D)   The slope of $\overline{AB}$ is NOT equal to the slope of $\overline{CD}$.

17. A tourist is standing at point T in the following diagram. The tourist wants to go to the nearest restroom facility. Which of the statements is correct?
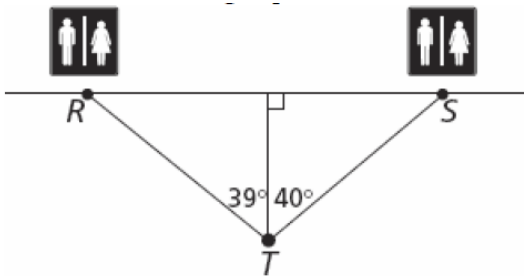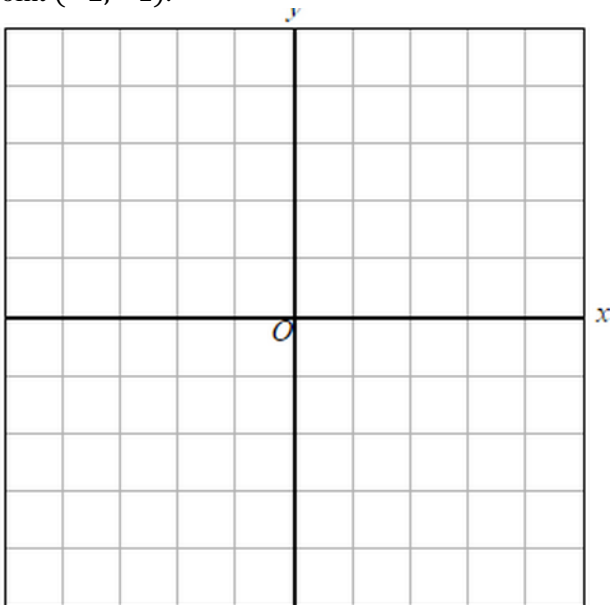

(A) Restroom facility R is closer.

(B) Restroom facility S is closer.

(C) Both restroom facilities are the same distance from the tourist.

(D) The only distance that can be determined correctly is RS.
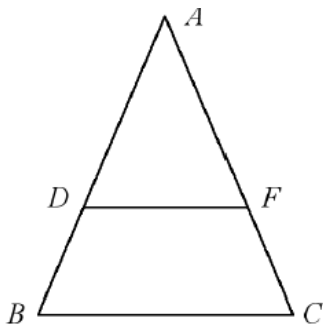
18. What is the measure of arc AB?

(A) 40°   (C) 110°
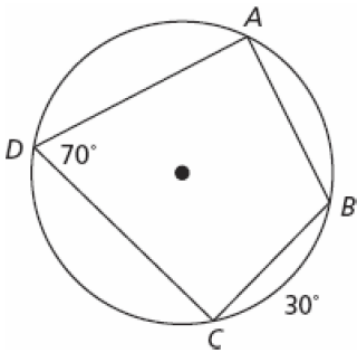
(B) 100°   (D) 140°

19. Use the graphing tool to graph a line that is perpendicular to the line given by $y = 2x + 3$ and passes through the point $(-2, -1)$.

20. Which would prove $\triangle ABC \sim \triangle ADF$?

(A) $\angle B \cong \angle C$

(B) $\overline{AD} \cong \overline{DB}$

(C) $\overleftrightarrow{BC} \parallel \overleftrightarrow{DF}$

(D) $\overline{AB} \cong \overline{AC}$

21. A directed line segment has initial point (1, 1). What are the coordinates of the point $\frac{2}{3}$ of the way to terminal point (4, 7)?

([   ] , [   ])

22. An arc through P and Q and two arcs intersecting at R have been drawn. One arc at R has been drawn from P and the other has been drawn from Q using the same compass setting. $\overline{QR}$ and $\overline{PR}$ have also been drawn. Choose the correct term to justify each step.
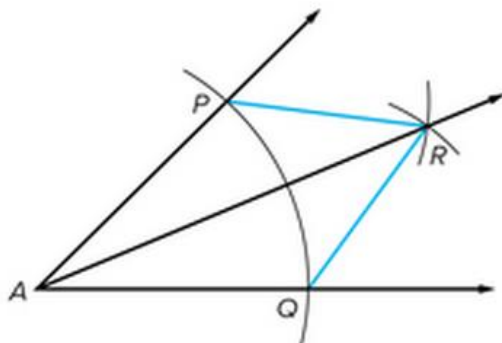
$\overline{QR} \cong \overline{PR}$ by [   ]

$\overline{AP} \cong \overline{AQ}$ by [   ]

$\overline{AR} \cong \overline{AR}$ by Reflexive Property of Congruence

$\triangle ARP \cong \triangle ARQ$ by [   ]

$\angle PAR \cong \angle QAR$ by [   ]

| construction |
| CPCTC |
| AAS |
| ASA |
| SAS |
| SSS |

23. Triangle XYZ has coordinates $X(-2, y), Y(2, 3), and\ Z(3, -1)$. What is the missing coordinate that makes $\triangle XYZ$ with base $\overline{XZ}$ isosceles?

$y =$ [   ]