1. **Which of the following is an undefined term in Geometry?**

A. point

B. ray

C. angle

D. All of these terms are undefined.

2. **Points *A*, *B*, *C*, and *D* lie on the same line.**

If B is between *A* and *C* and *D* is between *A* and *B*, which of the following MUST be true?

A. $AB = BC$

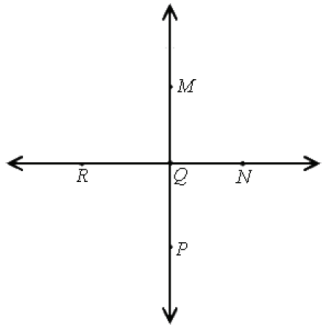
B. $AD = BC$

C. $AB + BC = AC$

D. $AD + BC = AC$

3. **Which of the following can be assumed from the figure?**

I. ∠*MQR* and ∠*MQN* are a linear pair
II. ∠*MQR* and ∠*PQN* are vertical angles
III. ∠*MQR* is a right angle



A. I and II only

B. II and III only

C. I and III only

D. I, II, and III

4. **Use the proof to answer the question below.**

Given: *B* is between *A* and *C*
***AB* = 8**
***AC* = 16**

Prove: *BC* = 8

Steps	Reasons
1) *B* is between *A* and *C*	1) Given
2) $AB = 8$	2) Given
3) $AC = 16$	3) Given
4) $AB + BC = AC$	4)
5) $8 + BC = 16$	5) Substitution Property
6) $BC = 8$	6) Subtraction Property

What reason justifies Step 4?

A. Addition Property

B. Definition of Bisector

C. Definition of Midpoint

D. Segment Addition Postulate

5. **Consider a proof by contradiction of:**

Given: *B* is between *A* and *C*
***AB* = 8**
***AC* = 16**

Prove: *BC* = 8 Which of the following describes the proof?

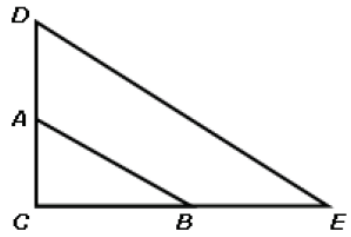
A. Assume either $AB \neq 8$, $AC \neq 16$, or *B* is not between *A* and *C*, then show *BC* cannot = 8 if this fact is true.

B. Assume that $AB \neq 8$, $AC \neq 16$, and *B* is not between *A* and *C*, then show *BC* cannot = 8 if these facts are true.

C. Assume $BC \neq 8$ then show either *AB* cannot = 8, *AC* cannot = 16, or *B* cannot be between *A* and *C* if this fact is true.

D. Assume $BC \neq 8$ then show *AB* cannot = 8, *AC* cannot = 16, and *B* cannot be between *A* and *C* if this fact is true.

6. **In the diagram below, $\overline{AB}$ and $\overline{DE}$ are parallel.**



Which of the following statements must be true?

A. ∠*C* is a right angle.

B. ∠*D* and ∠*E* are congruent.

C. Triangles *ABC* and *DEC* are similar.

D. None of the above

7. **"The two diagonals of a quadrilateral bisect each other."**

Which of the following best describes a COUNTEREXAMPLE to the assertion above?

A. a non–square rectangle

B. a non–square rhombus

C. a square

D. a trapezoid

8. **Which figure can serve as a COUNTEREXAMPLE to the conjecture below?**

If a polygon has an acute interior angle, then it must have at least one interior angle that is right or obtuse.

A. a parallelogram

B. a rectangle

C. a trapezoid

D. a triangle

9. **Given: $\overline{AB}$ bisects $\overline{CD}$ at point *E*. Which of the following MUST be true?**

A. $AB = CD$

B. $AE = ED$

C. $m\angle AEB = m\angle CED$

D. $m\angle AEB = m\angle CEB$

10. **Mark made the conjecture "all equilateral triangles are congruent." He offered the following argument to support his assertion.**

Step 1: If a triangle is equilateral, then it is also equiangular.
Step 2: If a triangle is equiangular, then each of the three angles has a measure of $\frac{180}{3}$.
Step 3: If two triangles each have three 60 degree angles, then the triangles are congruent by the AA postulate.

Which of the following statements BEST summarizes the error in Mark's argument?

A. Equilateral triangles are not always equiangular.

B. The angles in a triangle do not have a sum of 180 degrees.

C. AA is not a congruence postulate.

D. Mark's argument has no errors.

11. **IF ΔDEF and ΔMNO are two triangles such that $\overline{DE} \cong \overline{MN}$ and $\overline{EF} \cong \overline{NO}$, which of the following would be sufficient to prove the triangles are congruent?**

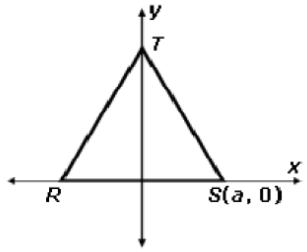
A. $\frac{DE}{MN} = \frac{EF}{NO}$

B. $\overline{DE} \cong \overline{DF}$

C. $\angle D \cong \angle M$

D. $\angle E \cong \angle N$

50. **Find the coordinates of point *T* in equilateral triangle *RTS* shown below.**



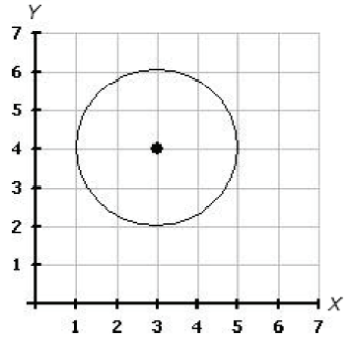
A. $(0, a)$

B. $(0, 2a)$

C. $(0, a\sqrt{3})$

D. $(0, 2a\sqrt{3})$

51. **What is the equation of the circle in the diagram?**



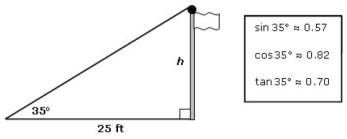
A. $(x - 4)^2 + (y - 3)^2 = 2$

B. $(x - 3)^2 + (y - 4)^2 = 2$

C. $(x - 3)^2 + (y - 4)^2 = 4$

D. $(x - 4)^2 + (y - 3)^2 = 4$

52. **Use the table below to determine the approximate height of the flag pole:**



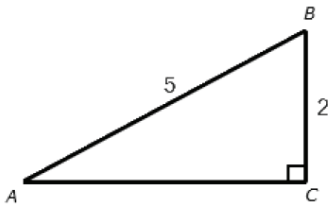
A. 14.3 ft

B. 17.5 ft

C. 20.5 ft

D. 35.7 ft

53. **Which of the following expressions has a value of $\frac{2}{5}$ in the picture below?**



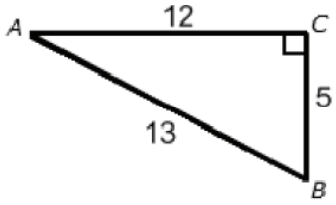
A. sin *B*

B. cos *B*

C. tan *B*

D. None of these

54. **Which of the following is the value of tan *B* in the picture below?**



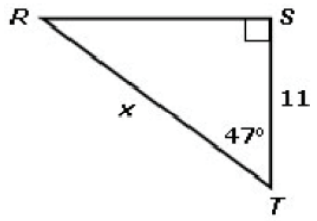
A. $\frac{5}{12}$

B. $\frac{12}{13}$

C. $\frac{12}{5}$

D. $\frac{13}{5}$

55. **Which equation correctly solves for *x* in Δ*RST*?**



A. $x = \frac{11}{\cos 47°}$

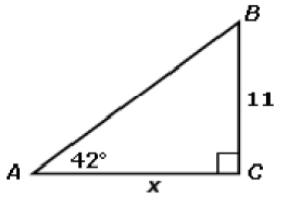
B. $x = \frac{11}{\sin 47°}$

C. $x = 11 \cos 47°$

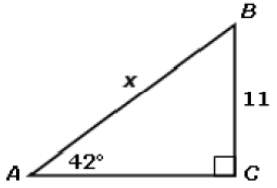
D. $x = 11 \sin 47°$

56. **The equation $x = \frac{11}{\sin 42°}$ correctly determines the length *x* for which of the following right triangles?**

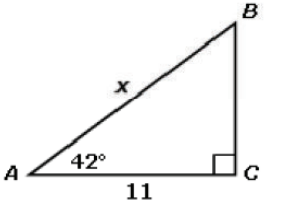
A.



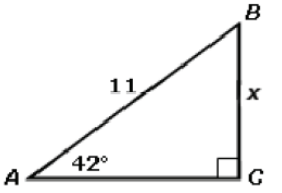
B.



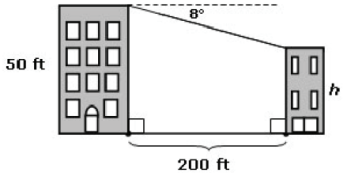
C.



D.



57. **Two buildings are 200 feet apart. The height of the taller building is 50 ft. The angle of depression from the top of the taller building to the top of the shorter building is 8°. What equation below will correctly determine the height (*h*) of the shorter building?**



A. $h = 50 - 200(\cos 82°)$

B. $h = 50 - 200(\sin 82°)$

C. $h = 50 - 200(\tan 82°)$

D. $h = 50 - 200(\tan 8°)$

58. **The hypotenuse of a 30°–60°–90° right triangle is $6\sqrt{3}$. What are the lengths of the two legs?**

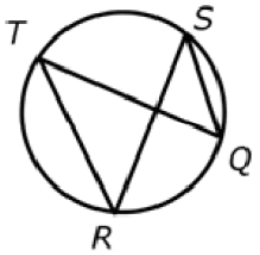
A. $2\sqrt{3}$ and 6

B. $3\sqrt{3}$ and 9

C. 6 and 18

D. 18 and $12\sqrt{3}$

59.



Which statement MUST be true in this figure?

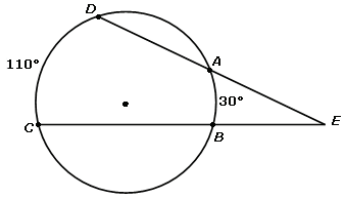
A. $\angle Q \cong \angle S$

B. $\angle Q \cong \angle R$

C. $\overline{TQ} \cong \overline{SR}$

D. $\overline{TQ} \perp \overline{RS}$

60. **If $m\overset{\frown}{AB} = 30°$ and $m\overset{\frown}{CD} = 110°$, find $m\angle E$.**



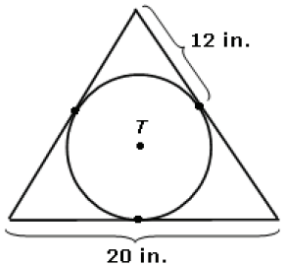
A. 15°

B. 30°

C. 40°

D. 70°

61. **Find the perimeter of the triangle circumscribed about circle *T*.**



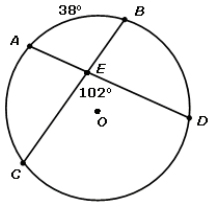
A. 60 in.

B. 64 in.

C. 68 in.

D. Cannot be determined.

62. **If $m\overset{\frown}{AB} = 38°$ and $m\angle CED = 102°$, find $m\overset{\frown}{CD}$.**



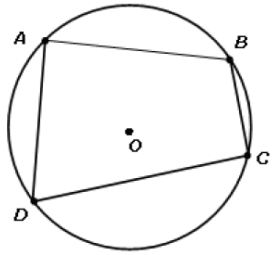
A. 70°

B. 102°

C. 140°

D. 166°

63. **Quadrilateral *ABCD* is inscribed in circle *O*. If $m\angle A = 88°$, what is $m\angle C$?**



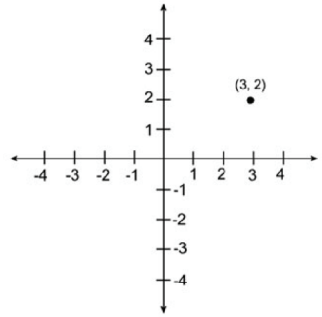
A. 88°

B. 90°

C. 92°

D. Not enough information to determine.

64. **Point *P* (3 , 2) is rotated 90 degrees clockwise about the origin. What are the coordinates of its image, *P*'?**



A. (−3 , −2)

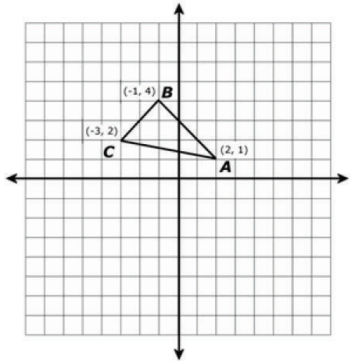
B. (−2 , 3)

C. (2 , −3)

D. (3 , −2)

65. **Triangle ABC is translated to triangle *A'B'C'* by the following motion rule.**

$(x , y) \rightarrow (x + 2, y - 5)$



What will be the coordinates of *A'*?

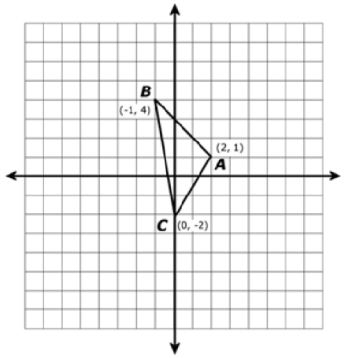
A. (4 , –4)

B. (2 , –5)

C. (0 , 6)

D. (–2 , 5)

66. **Triangle *ABC* is reflected over the line $y = x$ to produce triangle *A'B'C'*.**



What will be the coordinates of *A'*?

A. (2 , –1)

B. (–2 , –1)

C. (2 , 1)

D. (1 , 2)