12 Given: $\triangle ABC \sim \triangle L MN$

What is the length of $\overline{AC}$?

F 11  
G 12  
H 22  
J 24
13 Given the following measures of the sides of triangles, which is a right triangle?

A  41 cm, 40 cm, 9 cm  
B  45 ft, 40 ft, 35 ft  
C  52 in., 50 in., 11 in.  
D  45 yd, 35 yd, 25 yd
Which of the following statements must be true about this Venn diagram?

F All rectangles are rhombi.
G Some rhombi are rectangles.
H Quadrilaterals are not rhombi or rectangles.
J All quadrilaterals are rhombi and rectangles.
Given: In this figure, $\overline{AC}$ and $\overline{BD}$ bisect each other.

Based on the information given, which triangle congruence theorem could be used to prove $\triangle AED \cong \triangle CEB$?

A. Angle-Angle-Side (AAS)
B. Angle-Side-Angle (ASA)
C. Side-Angle-Side (SAS)
D. Side-Side-Side (SSS)
16 Statement: *If lines are skew, then they are not coplanar.*

What is the contrapositive of the statement?

F If lines are not coplanar, then they are skew.
G If lines are not skew, then they are coplanar.
H If lines are coplanar, then they are not skew.
J If lines are skew, then they are coplanar.
17 Coordinates $A(2, 5), B(6, 4)$, and $C(6, 0)$ are connected to form $\triangle ABC$.

If $\triangle CDA$ is congruent to $\triangle ABC$, what are the coordinates of $D$?

A  $(1, 1)$  
B  $(1, 2)$  
C  $(2, 2)$  
D  $(2, 1)$
18 Let $p = \text{An equation is of the form } y = mx + b.$
Let $q = \text{Its graph is a line.}$

Argument: If an equation is of the form $y = mx + b$, then its graph is a line. The graph is not a line. Therefore, the equation is not of the form $y = mx + b$.

Which of the following is the symbolic representation of the given argument?

F
\[
\begin{align*}
p & \to q \\
\sim q & \\
\therefore \sim p & 
\end{align*}
\]

G
\[
\begin{align*}
p & \to q \\
q & \\
\therefore p & 
\end{align*}
\]

H
\[
\begin{align*}
p & \to q \\
\sim p & \\
\therefore \sim q & 
\end{align*}
\]

J
\[
\begin{align*}
p & \to q \\
p & \\
\therefore q & 
\end{align*}
\]
19 $\triangle TRG$ is a right triangle.

Which is closest to the length of $RT$?

A 5  
B 11  
C 14  
D 28
Which list has the sides of $\triangle ABC$ ordered from longest to shortest?

F  $BC, AC, AB$

G  $AB, AC, BC$

H  $AC, AB, BC$

J  $BC, AB, AC$
Three survey markers are located on a map at points $H$, $I$, and $J$. A triangle is formed by connecting these markers by string so that $HI = 150$ feet, $HJ = 245$ feet, and $IJ = 365$ feet.

Which statement is true about the measures of the angles of $\triangle HIJ$?

A $m \angle H$ is the smallest
B $m \angle H$ is the largest
C $m \angle I$ is the smallest
D $m \angle I$ is the largest
In the figure, what is the value of $x$?

F  6  
G  $6\sqrt{2}$  
H  $6\sqrt{3}$  
J  12
23 Two sides of a triangle measure 14 inches and 8 inches. Which *cannot* be the length of the remaining side?

A 6 in.
B 8 in.
C 14 in.
D 21 in.
What value of $x$ makes $\triangle DEF \cong \triangle JLK$?

F $x = 9.4$
G $x = 6.0$
H $x = 5.3$
J $x = 4.1$
Mr. Ammons is constructing a walkway through his rectangular garden. The walkway runs diagonally as shown in the diagram.

Which is closest to the length of the walkway?

A. 18.7 ft  
B. 28.3 ft  
C. 30.0 ft  
D. 39.0 ft
14 In the triangle shown, \( GR = 11 \), \( BR = 8 \), and \( BG = 7 \).

Which statement is true about the angles in \( \triangle RGB \)?

F \( \angle R \) is the greatest
G \( \angle G \) is the greatest
H \( \angle R \) is the least
J \( \angle G \) is the least
15 Consider the following statement.

\[ 4x = 8, \text{ then } x = 2. \]

Which is the inverse of the statement?

A  If \( x = 2 \), then \( 4x = 8 \).
B  If \( x \neq 2 \), then \( 4x \neq 8 \).
C  If \( x = 2 \), then \( 4x \neq 8 \).
D  If \( 4x \neq 8 \), then \( x \neq 2 \).
16 Which drawing contains a pair of similar triangles?

F

G

H

J
17 Triangle $ABC$ is an equilateral triangle with side lengths of 10 inches.

What is the length, in inches, of $\overline{AD}$?

A  5

B  $\frac{10\sqrt{3}}{3}$

C  $5\sqrt{2}$

D  $5\sqrt{3}$
18. John wants to make a triangular garden. Which of the following are possible dimensions?

F  4 ft by 5 ft by 10 ft
G  6 ft by 6 ft by 12 ft
H  6 ft by 8 ft by 10 ft
J  8 ft by 12 ft by 20 ft
19  A drawing of Mark’s kite is shown below.

What is the length of the short section of the outer frame indicated by $x$ in the drawing?

A  16 in.
B  15 in.
C  14 in.
D  13 in.
20 Which Venn diagram represents all the following set of statements?

- Some triangles are acute.
- Some triangles are obtuse.
- No triangle is both acute and obtuse.
- Some acute triangles are equilateral.
Which lists the sides of $\triangle BCD$ in order from shortest to longest?

A  $\overline{CD}, \overline{BD}, \overline{BC}$

B  $\overline{BC}, \overline{CD}, \overline{BD}$

C  $\overline{BD}, \overline{CD}, \overline{BC}$

D  $\overline{BC}, \overline{BD}, \overline{CD}$
22. With the information given in the drawings, which pair of triangles can be proven congruent by the Side-Angle-Side postulate?
23 Given: \( \triangle QRS \) where \( m \angle Q = 20^\circ \) and \( m \angle S = 90^\circ \)

What is the length, to the nearest meter, of \( RS \)?

A 342 m  
B 364 m  
C 500 m  
D 940 m
12 What is the *converse* of the following statement?

*If Joe goes fishing, then he needs bait.*

F If he needs bait, then Joe goes fishing.
G If Joe does not go fishing, then he does not need bait.
H If he does not need bait, then Joe does not go fishing.
J If Joe goes fishing, then he does not need bait.
13 In which group of statements is the conclusion *not* justified by the previous pair of statements?

A All cooks work in the kitchen.
   Mary is a cook.
   Mary works in the kitchen.

B All dinosaurs are extinct.
   A triceratops is a dinosaur.
   All triceratops are extinct.

C All squares are rectangles.
   All rectangles are parallelograms.
   All squares are parallelograms.

D All fish live in the water.
   Some snakes live in the water.
   Some snakes are fish.
Let \( p \) represent
\[ x^2 = 21, \]
and let \( q \) represent
\[ x \text{ is not a whole number.} \]

Which is a representation of the statement below?

If \( x \) is a whole number, then \( x^2 \neq 21. \)

\[ \begin{align*}
F & \quad \sim p \rightarrow \sim q \\
G & \quad \sim p \rightarrow q \\
H & \quad p \rightarrow \sim q \\
J & \quad \sim q \rightarrow \sim p
\end{align*} \]
15 Which pipe lengths could be joined to form a triangle?

A 15 ft, 6 ft, 5 ft
B 13 ft, 12 ft, 5 ft
C 40 ft, 20 ft, 10 ft
D 19 ft, 16 ft, 2 ft
Joseph is standing 12 feet from a mirror lying on the ground, and his eyes are 5 feet above the ground.

The line-of-sight reflection on the mirror makes \( \angle 1 \) congruent to \( \angle 2 \). If the building is 264 feet from the mirror, which is closest to the height of the building?

F 100 ft  
G 110 ft  
H 130 ft  
J 145 ft
In addition to the information given in the drawing, which statement would be sufficient to prove that $\triangle ABC \sim \triangle DEF$?

A \[ \frac{BC}{AC} = \frac{1}{2} \]

B \[ \frac{BC}{AC} = \frac{9}{4} \]

C \[ AC = 18 \text{ and } BC = 8 \]

D \[ AC = 8 \text{ and } BC = 18 \]
Which lists the angles of the triangle in order from least to greatest?

F  $\angle R, \angle Q, \angle P$
G  $\angle Q, \angle P, \angle R$
H  $\angle P, \angle R, \angle Q$
J  $\angle P, \angle Q, \angle R$
19 Jennifer made these measurements on \( \triangle ABC \). \( BC \) must be —

\[ \text{A} \quad 	ext{less than 10 inches} \\
\text{B} \quad 	ext{between 10 and 12 inches} \\
\text{C} \quad 	ext{between 12 and 22 inches} \\
\text{D} \quad 	ext{greater than 22 inches} \]
According to the diagram, which is true?

F  No bushes are flowering plants.
G  No roses are bushes.
H  Some roses are not flowering plants.
J  Some flowering plants are bushes.
What is the length of $SU$?

A  $2\sqrt{7}$ cm  
B  7 cm  
C  $4\sqrt{7}$ cm  
D  20 cm
What is the value of $z$?

F $2\sqrt{2}$
G $2\sqrt{3}$
H $4\sqrt{2}$
J $8\sqrt{2}$
From a point 12 feet from the base of a building, the angle of elevation from the ground to the top of the building is $70^\circ$.

Which is closest to the height of the building?

A  24 ft  
B  33 ft  
C  35 ft  
D  41 ft