TEST NAME: **Analytic Geometry | Unit 1 Problem Set**
TEST ID: **34038**
GRADE: **Grade 10**
SUBJECT: **Mathematics**
TEST CATEGORY: **Common Assessments**

Student:

Class:

Date:

1. **Consider these statements.**

   • Every trapezoid is a quadrilateral.
   • Polygon *W* is not a quadrilateral.

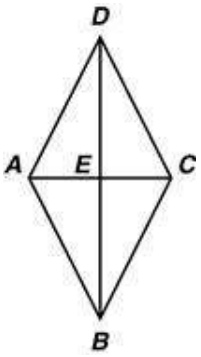
   Which conclusion can be made using both statements?

   A. Polygon *W* is not a trapezoid.
   B. Polygon *W* is a pentagon.
   C. Polygon *W* is not a parallelogram.
   D. Polygon *W* is a triangle.

2. **Which of the following statements is not true?**

   A. The diagonals of a square always bisect each other.
   B. The diagonals of a rhombus always bisect each other.
   C. The diagonals of a trapezoid always bisect each other.
   D. The diagonals of a parallelogram always bisect each other.

3. **Given:** $\overline{AD} \cong \overline{BC}$ **and** $\angle ADE \cong \angle CBE$
Prove: *ABCD* is a parallelogram.



STATEMENT	**REASON**
1. $\overline{AD} \cong \overline{BC}$ **and** $\angle ADE \cong \angle CBE$	**1. Given**
2.	**2.**
3. *ABCD* is a parallelogram.	**3. If one pair of opposite sides of a quadrilateral are parallel and congruent, then the quadrilateral is a parallelogram.**

Which statement and reason could be used to complete this proof?

A. Statement: $\overline{AB} \parallel \overline{DC}$
Reason: If the corresponding angles formed by a pair of lines cut by a transversal are congruent, then the pair of lines are parallel.

B. Statement: $\overline{AD} \parallel \overline{BC}$
Reason: If the same-side interior angles formed by a pair of lines cut by a transversal are supplementary, then the pair of lines are parallel.

C. Statement: $\overline{AB} \parallel \overline{DC}$
Reason: If the alternate interior angles formed by a pair of lines cut by a transversal are congruent, then the pair of lines are parallel.

D. Statement: $\overline{AD} \parallel \overline{BC}$
Reason: If the alternate interior angles formed by a pair of lines cut by a transversal are congruent, then the pair of lines are parallel.

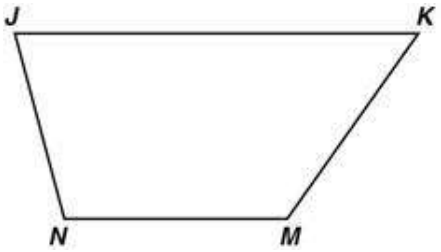
4. **Wade wanted to construct a polygon inscribed in a circle by paper folding. He completed the following steps:**

- Start with a paper circle. Fold it in half. Make a crease.
- Take the half circle and fold it in thirds. Crease along the sides of the thirds.
- Open the paper. Mark the intersection points of the creases with the circle.
- Connect adjacent intersection points on the circle with segments.

Which polygon was Wade most likely trying to construct?

A. regular octagon
B. regular hexagon
C. regular pentagon
D. equilateral triangle

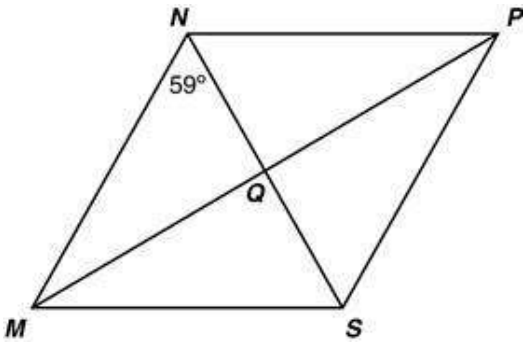
5. **In the figure below, $\overline{JK}$ is parallel to $\overline{NM}$.**



Which statement about the figure must be true?

A. $180° - m\angle NJK = m\angle JKM$
B. $180° - m\angle KMN = m\angle JKM$
C. $m\angle JNM + m\angle NMK = 180°$
D. $m\angle JNM + m\angle JKM = 180°$

6. **The diagram below shows Rhombus *MNPS* with diagonals intersecting at Point *Q*.**

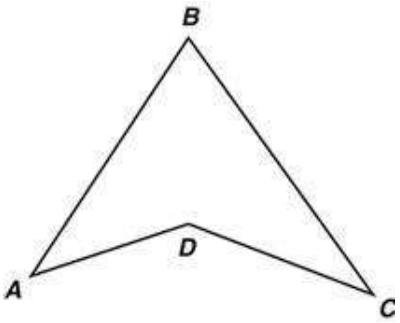


To find $m\angle NPS$, Roberto completed the following steps of a proof, but did not provide any reasons. Which reason can be used to justify Step 3?

Step 1. ***MNPS*** **is a rhombus.**
Step 2. $m\angle QNP = 59°$
Step 3. $\overline{NS} \perp \overline{MP}$
Step 4. $m\angle MQN = 90°$
Step 5. $m\angle NMQ = 31°$
Step 6. $m\angle NMS = 62°$
Step 7. $m\angle NPS = 62°$

A. The diagonals of a rhombus bisect the angles.
B. The diagonals of a rhombus bisect each other.
C. The diagonals of a rhombus are perpendicular.
D. The opposite angles of a rhombus are congruent.

7. **In Quadrilateral *ABCD*, $m\angle ADC >$ 180º.**



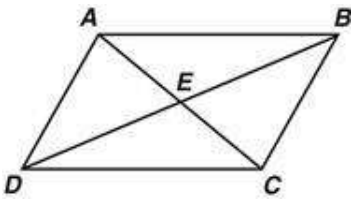
Which statement about Quadrilateral *ABCD* is correct?

A. *ABCD* has no diagonals.
B. *ABCD* has only one diagonal.
C. *ABCD* has diagonals that do not intersect.
D. *ABCD* has diagonals that are the same length.

8. In Quadrilateral $ABCD$, $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \parallel \overline{AD}$. What MUST be true about Quadrilateral $ABCD$?

A. Adjacent sides are congruent.
B. Opposite sides are congruent.
C. Opposite angles are supplementary.
D. Consecutive angles are complementary.

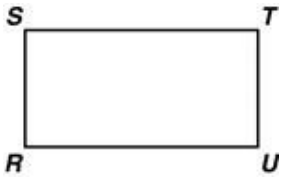
9. **Clarissa is writing a proof to show that the diagonals of a parallelogram bisect each other. She is using the figure below.**



Which of the following statements should be used in Clarissa's proof?

A. $\angle DEC \cong \angle BEA$
B. $\overline{AB} \parallel \overline{CD}$
C. $AE = EC$
D. $AE + ED = BE + EC$

10. **Which conditions are sufficient to prove that quadrilateral *RSTU* is a rectangle?**



A. $\overline{RS} \parallel \overline{TU}$ and $\overline{ST} \parallel \overline{RU}$
B. $\text{m}\angle R = \text{m}\angle U = \text{m}\angle T \angle = \text{m}\angle S$
C. $RS = TU$ and $ST = RU$
D. $\overline{RS} \cong \overline{TU} \cong \overline{ST} \cong \overline{RU}$

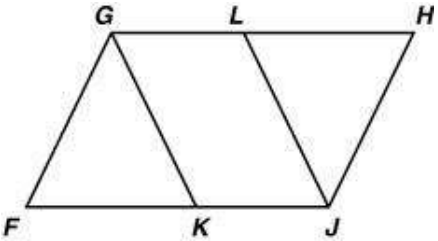
11. **Quadrilateral *L M N P* has diagonals $\overline{LN}$ and $\overline{MP}$. The two diagonals intersect at point *D*. If *D* is the midpoint of $\overline{LN}$ and $\overline{MP}$, which relationship must be true?**

A. $\overline{DM} \cong \overline{DN}$
B. $\overline{PN} \cong \overline{LM}$
C. $\overline{PL} \cong \overline{NP}$
D. $\overline{PM} \cong \overline{LN}$

12. **Which statement can be used to prove that a quadrilateral is either a rectangle or an isosceles trapezoid?**

A. The diagonals are congruent.
B. The opposite sides are parallel.
C. The diagonals bisect each other.
D. The opposite angles are congruent.

13. **Given: *FGHJ* is a parallelogram.**



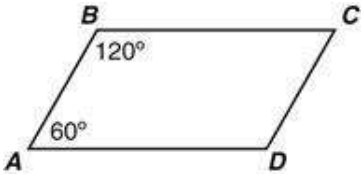
Which statement would be sufficient to prove that Quadrilateral *GLJK* is a parallelogram?

A. $\overline{FG} \cong \overline{GK}$
B. $\angle GFK \cong \angle JHL$
C. $\angle HLJ \cong \angle HGK$
D. $\overline{KF} \cong \overline{HJ}$

14. **Quadrilateral *LMNP* has diagonals $\overline{LN}$ and $\overline{MP}$. The two diagonals intersect at Point *D*. If *D* is the midpoint of $\overline{LN}$ and $\overline{MP}$, which of the following relationships must be true?**

A. $\triangle PDN \cong \triangle MDL$
B. $\triangle LPD \cong \triangle PDN$
C. $\triangle PNM \cong \triangle LNM$
D. $\triangle MPL \cong \triangle LNP$

15. **Two of the angle measures of Parallelogram *ABCD* are 60° and 120°, as shown below.**



Which statement gives the measures of Angle *C* and Angle *D* with supporting reasons?

A. $m\angle C =$120° and$m\angle D =$60°, because the sum of the angles in a parallelogram is 360° and opposite angles of a parallelogram equal 180°

B. $m\angle C =$60° and$m\angle D =$120°, because the sum of the angles in a parallelogram is 360° and opposite angles in a parallelogram are congruent

C. $m\angle C =$30° and$m\angle D =$60°, because one set of opposite angles of a parallelogram is equal to 90° and the other set is equal to 180°

D. $m\angle C =$180° and$m\angle D =$180°, because the sum of the measures of Angles *A* and *B* equals 360° and 180°$+$180°$=$360°

16. **Which statement below is false?**

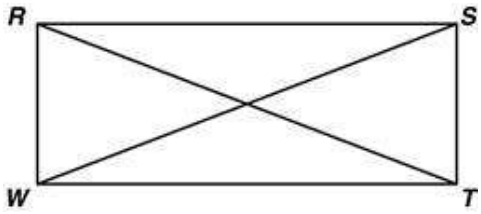
A. A square is a rhombus.

B. A triangle is a polygon.

C. A rectangle is a quadrilateral.

D. A trapezoid is a parallelogram.

17. **Given Quadrilateral *RSTW*, which conditions are sufficient to prove that *RSTW* is a rectangle?**



A. $\overline{ST} \parallel \overline{RW}, \overline{RS} \perp \overline{ST}$

B. $\overline{RS} \parallel \overline{TW}, \overline{ST} \parallel \overline{RW}$

C. $\overline{RT}$bisects$\overline{SW}$and$\overline{SW}$bisects$\overline{RT}$

D. $\overline{SR} \cong \overline{RW}and\overline{RT}$is the perpendicular bisector of$\overline{SW}$

18. **Which statement is true for all convex quadrilaterals?**

A. All sides are congruent.

B. Opposite angles are congruent.

C. At least one pair of sides must be parallel.

D. The measure of each interior angle is less than 180°.

19. **Which of the following statements about quadrilaterals is TRUE?**

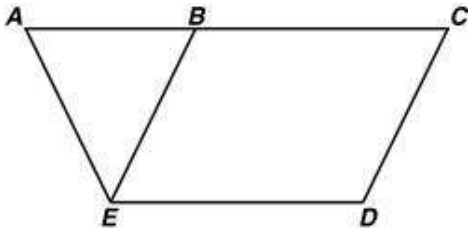
A. No squares are rectangles.

B. All rectangles are squares.

C. No kites are rectangles.

D. Some parallelograms are kites.

20. **Given: In Quadrilateral *ACDE*, $\angle EAB \cong \angle EBA$, $\overline{AE} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DE}$.**
Prove: *BCDE* is a parallelogram.



STATEMENTS	REASONS
1. *PQRS* is a parallelogram; *S*, *P*, and *T* are collinear	1. Given
2. $\overline{AE} \cong \overline{BE}$	2. Converse of the isosceles triangle theorem
3. $\overline{BE} \cong \overline{CD}$	3. Substitution Property
4. *BCDE* is a parallelogram	4. ?

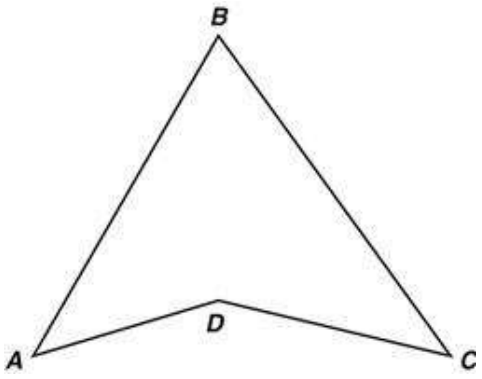
Which statement can be used to justify Step 4 in this proof?

A. If one pair of opposite sides of a quadrilateral is both parallel and congruent, then the quadrilateral is a parallelogram.
B. If both pairs of opposite angles in a quadrilateral are congruent, then the quadrilateral is a parallelogram.
C. If both pairs of opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram.
D. If both pairs of opposite sides of a quadrilateral are parallel, then the quadrilateral is a parallelogram.

21. **Which condition makes a trapezoid an isosceles trapezoid?**

A. A trapezoid is isosceles if and only if it is a rectangle.
B. A trapezoid is isosceles if and only if it has two right angles.
C. A trapezoid is isosceles if and only if the base angles are congruent.
D. A trapezoid is isosceles if and only if a pair of consecutive sides is congruent.

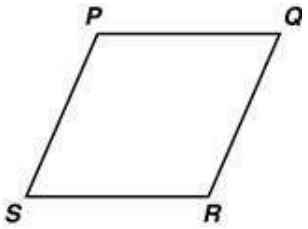
22. **In quadrilateral** $ABCD$, $m\angle ADC > 180°$.



Which statement about quadrilateral $ABCD$ **is correct?**

A. $m\angle CDA > m\angle ABC$
B. $m\angle CDA < m\angle DAB$
C. $m\angle DAB > m\angle BCD$
D. $m\angle ABC < m\angle BCD$

23. **Given: Quadrilateral *PQRS* with $\overline{PQ} \parallel \overline{RS}$ and $\overline{PQ} \cong \overline{RS}$.**



Hector began a proof using the following argument.

1. $\overline{PQ} \cong \overline{RS}$ **and** $\overline{PQ} \parallel \overline{RS}$ **(Given)**

2. Quadrilateral *PQRS* is a parallelogram by Properties of Parallelograms (opposite sides parallel and congruent)

3. $\overline{PS} \parallel \overline{QR}$ **by Definition of Parallelogram.**

Which statement is a valid conclusion to Hector's argument?

A. $\overline{PQ} \cong \overline{QR}$

B. $\overline{PS} \cong \overline{QR}$

C. Quadrilateral *PQRS* is a kite.

D. Quadrilateral *PQRS* is a rhombus.

24. **Sheena claims that all quadrilaterals are rectangles. Which of the statements below disproves Sheena's claim?**

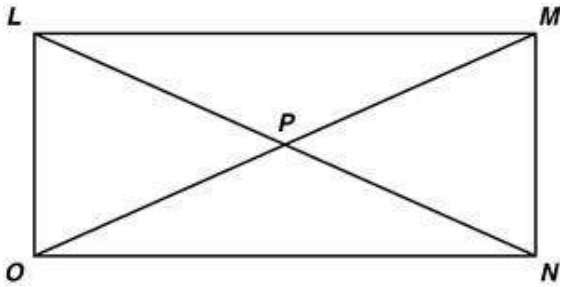
A. A square is a quadrilateral.

B. Quadrilaterals are polygons.

C. A trapezoid is a quadrilateral.

D. Quadrilaterals have four sides.

25. **Which of the following is sufficient to prove that the parallelogram below is a rectangle?**



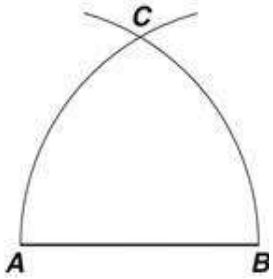
A. $\overline{LO} \perp \overline{LM}$

B. $\angle LMN \cong \angle NOL$

C. $\overline{LP} \cong \overline{PN}$ and $\overline{MP} \cong \overline{OP}$

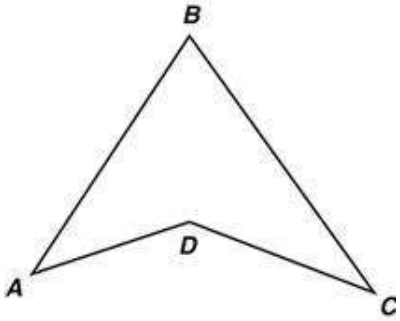
D. $\overline{MP} \perp \overline{PN}$ and $\overline{LP} \perp \overline{OP}$

26. **What type of triangle is constructed in the figure below?**



A. right triangle
B. obtuse triangle
C. equilateral triangle
D. isosceles triangle

27. **In quadrilateral *ABCD*,** $m \angle ADC > 180°$.



Which statement about quadrilateral *ABCD* is correct?

A. $m \angle BCD + m \angle CDA + m \angle DAB + m \angle ABC > 360°$
B. $m \angle BCD + m \angle DAB + m \angle ABC > m \angle CDA$
C. $m \angle BCD + m \angle DAB = m \angle CDA$
D. $m \angle BCD + m \angle CDA + m \angle DAB + m \angle ABC = 360°$

28. **What conclusion can be drawn from the following information about quadrilateral *MNOP*?**

$\overline{MN} \parallel \overline{OP}, \overline{MP} \parallel \overline{NO}, \overline{MN} \cong \overline{OP}, \overline{MP} \cong \overline{NO}$

A. *MNOP* is a rectangle.
B. *MNOP* is a parallelogram.
C. *MNOP* is a trapezoid.
D. *MNOP* is a rhombus.

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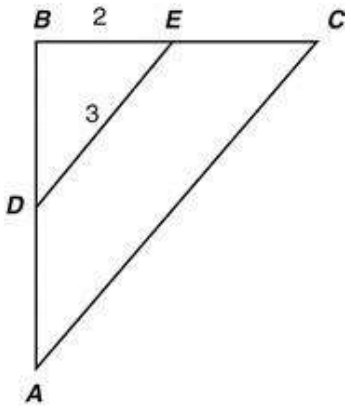
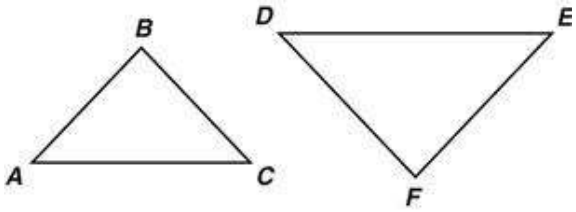
88. **Point *D* is the midpoint of $\overline{AB}$, and Point *E* is the midpoint of $\overline{BC}$.**



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

A. 2
B. 3
C. 4
D. 6

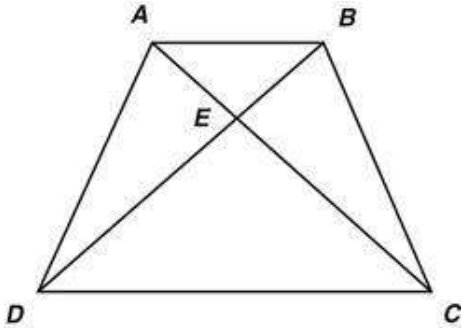
89. **In the triangles below, $\frac{AC}{ED} = \frac{BC}{FD}$ and $\angle B \cong \angle F$.**



Which statement must be true?

A. $\overline{AC} \cong \overline{DE}$
B. $\overline{AB} \cong \overline{EF}$
C. $\triangle ABC \sim \triangle EFD$
D. $\triangle ABC \cong \triangle EFD$

90. **In Quadrilateral *ABCD* below, diagonal line segments *AC* and *BD* intersect at Point *E* inside the quadrilateral.**



Given information about Quadrilateral *ABCD* is:

$\overline{AD} \cong \overline{BC}$

$\angle ACB \cong \angle ADB$

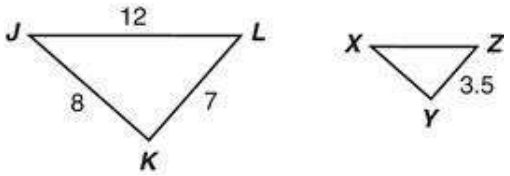
The table below shows an incomplete proof for the statement $\angle ADC \cong \angle BCD$. Four steps in the proof are missing.

Statement	Reason
1.	1.
2.	2.
3. $\triangle AED \cong \triangle BEC$	3. AAS
4. $AE = BE;\ EC = ED$	4. Corresponding parts of congruent triangles are congruent
5.	5.
6. $AE + EC = AC;$ $BE + ED = BD$	6. Segment addition
7. $AC = BD$	7. Substitution (step 5 and step 6)
8. $\overline{CD} \cong \overline{CD}$	8. Reflexive property
9.	9.
10. $\angle ADC \cong \angle BCD$	10. Corresponding parts of congruent triangles are congruent

- **Fill in the missing statements and reasons in the table.**

Note: Some statements can have two or more parts, as long as the parts have the same reason.

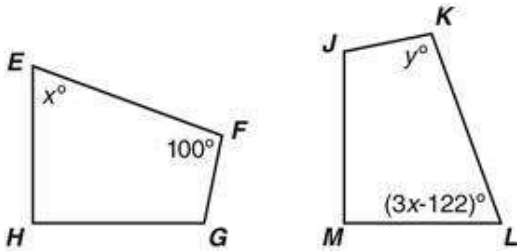
91. **Triangle *JKL* is similar to Triangle *XYZ*.**



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

A. 4
B. 6.0
C. 8.5
D. 24

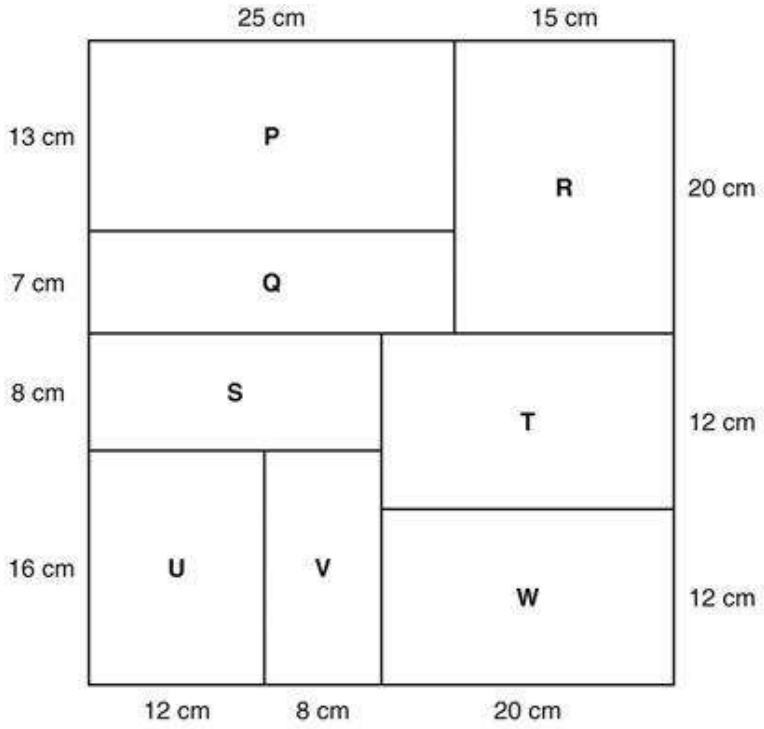
92. **In the diagram,** $EFGH \cong LKJM$.



What is the value of *x*?

A. 61
B. 74
C. 80
D. 100

93. **The magazine page shown below has been divided into eight sections. Each section will be filled with an advertisement or a story.**

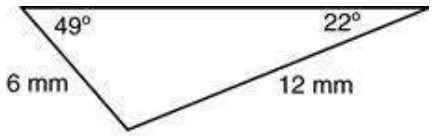


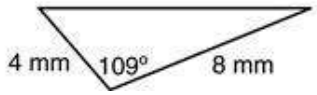
According to the dimensions given, which two sections are similar?

A. P and W
B. Q and V
C. R and U
D. S and T

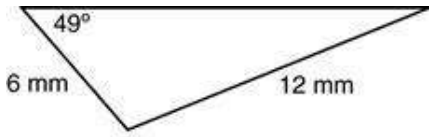
94. **Based only on the given information, which pair of triangles can be proven similar using the Side-Angle-Side Similarity Postulate?**

A.

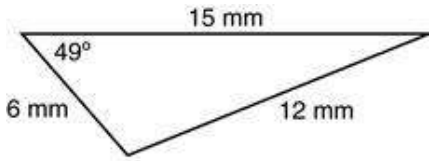


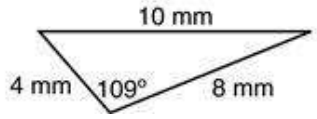


B.

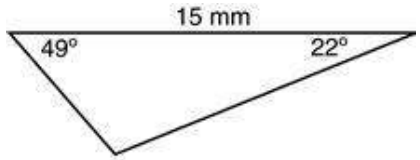


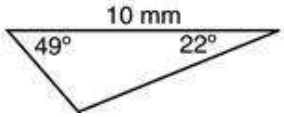
C.



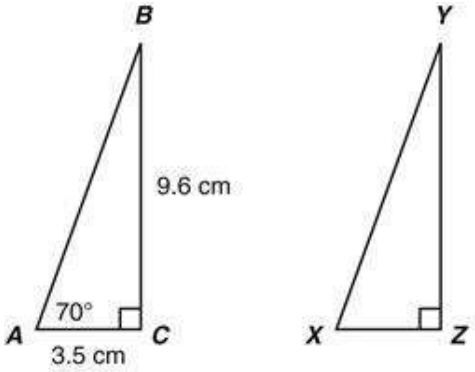


D.





95. **Triangle *ABC* is congruent to Triangle *XYZ* as shown.**



Which statement must be true?

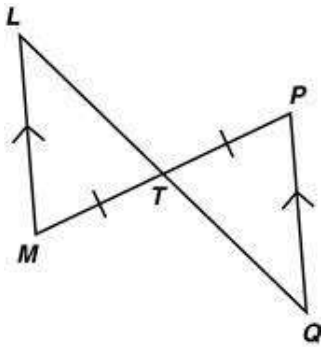
A. $m\angle X = 70°$
B. $m\angle Z = 70°$
C. $XY = 3.5$ cm
D. $XZ = 9.6$ cm

96. **The sides of a triangle have lengths of 9 cm, 11 cm, and 16 cm. What is the perimeter of a similar triangle whose longest side is 24 cm?**

A. 30 cm
B. 36 cm
C. 44 cm
D. 54 cm

97. **A proof is shown below.**

Given: $\overline{LM} \parallel \overline{PQ}$ **and** $\overline{MT} \cong \overline{TP}$



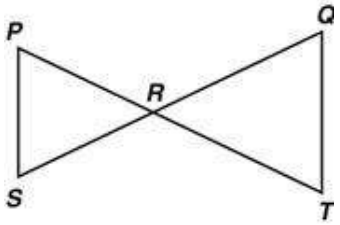
Prove: $\triangle LMT \cong \triangle QPT$

STATEMENT	**REASON**
1. $\overline{LM} \parallel \overline{PQ}, \overline{MT} \cong \overline{TP}$	**1. Given**
2. $\angle MLT \cong \angle PQT$	**2. Alternate Interior Angles Theorem**
3. $\angle LTM \cong \angle QTP$	**3. _____**
4. $\angle LMT \cong \angle QTP$	**4. Angle-Side-Angle Theorem**

Which reason is justification for statement 3?

A. Angle Bisector Theorem
B. Vertical Angles Theorem
C. definition of congruent angles
D. definition of congruent triangles

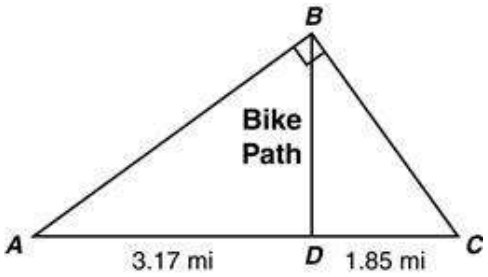
98. **In the figure below,** $\overline{PS}$ **is parallel to** $\overline{QT}$. **Points *P*, *R*, and *T* are collinear and Points *S*, *R*, and *Q* are collinear.**



Which statement must be true?

A. $\triangle PRS \sim \triangle RQT$
B. $\triangle PRS \sim \triangle TRQ$
C. $\triangle PRS \cong \triangle RQT$
D. $\triangle PRS \cong \triangle TRQ$

99. **A city planner is designing a new bike path through a park modeled by the figure below.**



Which relationship represents the best estimate of the length of the bike path from *D* to *B* in miles?

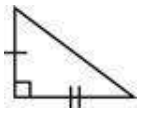
A. $\sqrt{3.17 \cdot 1.85} \approx 2.4$

B. $\sqrt{3.17 + 5.02} \approx 2.9$

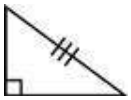
C. $\sqrt{1.85^2 + 3.17^2} \approx 3.7$

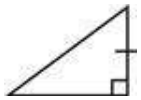
D. $\sqrt{3.17 \cdot 5.02} \approx 4.0$

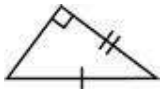
100. **A triangle is shown below.**

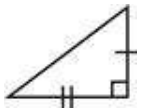


Which triangle is congruent to the triangle?

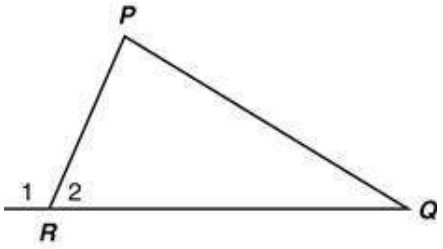
A. 

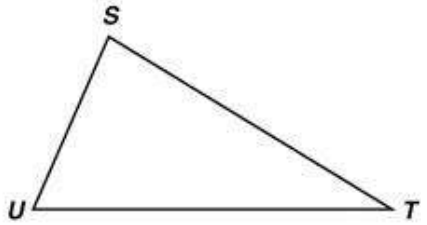
B. 

C. 

D. 

101. **Triangles *PQR* and *STU* are shown below.**





Which additional fact is needed to prove $\triangle PQR \cong \triangle STU$**, given** $\angle 1$ **and** $\angle 2$ **are collinear,** $\overline{PR} \cong \overline{SU}$ **and** $\overline{RQ} \cong \overline{UT}$**?**

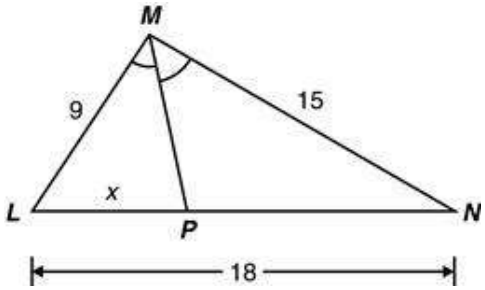
A. $\angle Q \cong \angle T$

B. $\angle P \cong \angle S$

C. $\angle 1$ and $\angle 2$ are supplementary

D. $\angle 1$ and $\angle U$ are supplementary

102. **In the figure below, the dimensions are given in units.** $\overline{MP}$ bisects $\angle LMN$.



Which proportion should be used to determine the value of *x*?

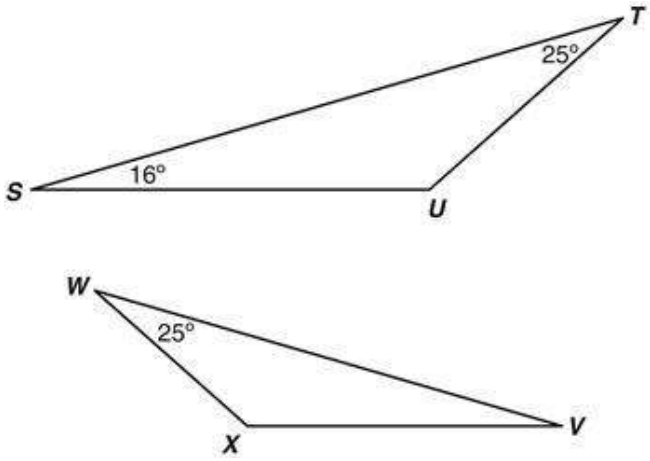
A. $\frac{9}{x} = \frac{15}{18-x}$

B. $\frac{x}{9} = \frac{15}{18-x}$

C. $\frac{15}{x} = \frac{9}{18-x}$

D. $\frac{x}{15} = \frac{9}{18-x}$

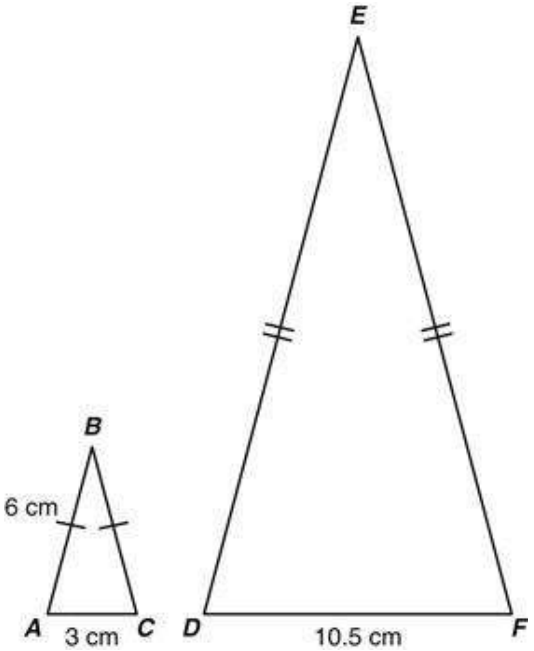
103. **Triangle *STU* is similar to Triangle *VWX*.**



What is the measure of Angle *X*?

A. 41°
B. 139°
C. 155°
D. 319°

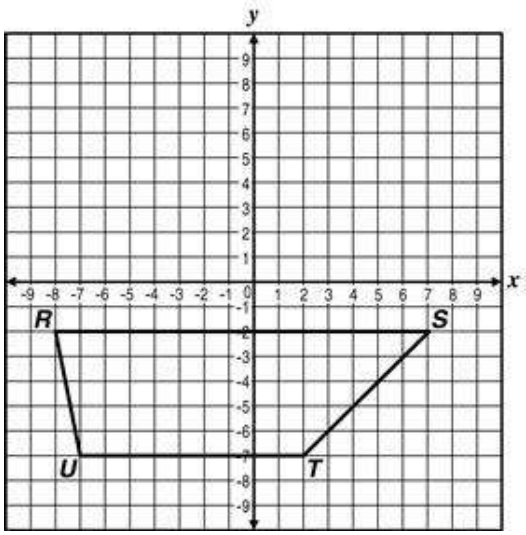
104. **Triangle *ABC* is similar to Triangle *DEF* as shown below.**



What is the perimeter of Triangle *DEF*?

A. 52.5 centimeters
B. 42.0 centimeters
C. 34.5 centimeters
D. 31.5 centimeters

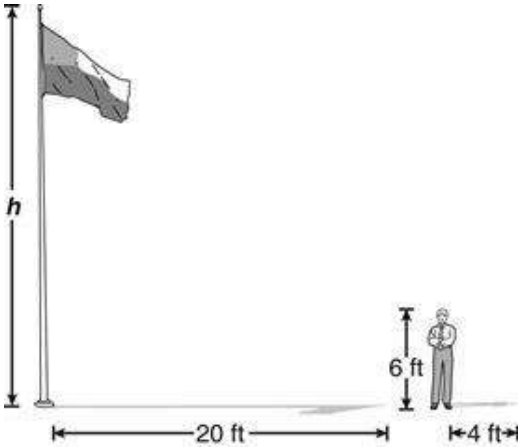
105. **Trapezoid *RSTU*, shown below, is similar to Trapezoid *LMNP*. Segment *TU* in Trapezoid *RSTU* corresponds to Segment *NP* in Trapezoid *LMNP*.**



If *NP* has a length of 3 units, what is the length, in units, of Segment *LM*?

A. 3
B. 5
C. 9
D. 15

106. **A man 6 feet tall casts a shadow 4 feet long. At the same time, a flagpole casts a shadow 20 feet long.**



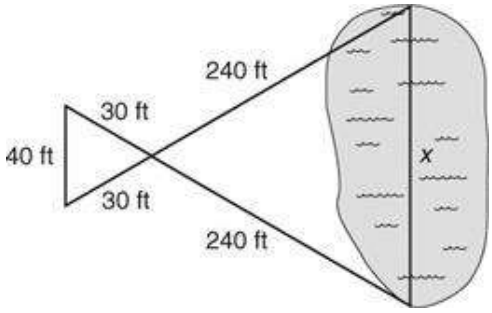
What is the height, *h*, of the flagpole?

A. 52 feet
B. 30 feet
C. 26 feet
D. 24 feet

107. **Anne builds two similar rectangular tables. The length of one of the tables is 8 feet and its width is 4 feet. The length of the second table is 2 feet. What is the width of the second table, in feet?**

A. 1
B. 4
C. 16
D. 30

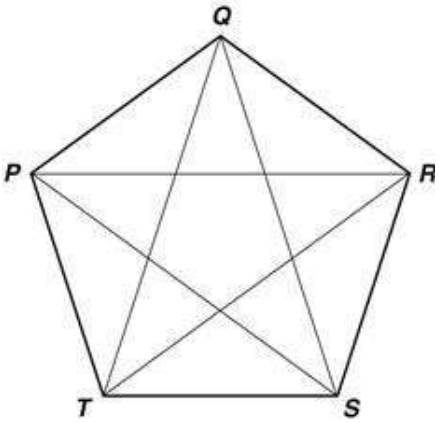
108. **A survey crew has laid out similar triangles to find the distance across a small lake.**



What is *x*, the distance across the lake?

A. 180 feet
B. 250 feet
C. 270 feet
D. 320 feet

109. **In the regular pentagon *PQRST*, $\overline{PS}$, $\overline{PR}$, $\overline{QT}$, $\overline{QS}$, and $\overline{RT}$ are diagonals.**



Which pair of triangles is congruent?

A. $\triangle QRT$ and $\triangle TSQ$
B. $\triangle PQT$ and $\triangle PRT$
C. $\triangle PRS$ and $\triangle QRS$
D. $\triangle TSR$ and $\triangle PQS$

110. **If two angles of one triangle are congruent to two angles in another triangle, then what must be true of the third angles of the triangles?**

A. They must be acute.
B. They must be obtuse.
C. They must be congruent.
D. They must be supplementary.

111. **Serena is $5\frac{1}{2}$ feet tall and casts a shadow that is 8 feet long. A nearby tree casts a shadow that is 32 feet long at the same time. How tall is the tree?**

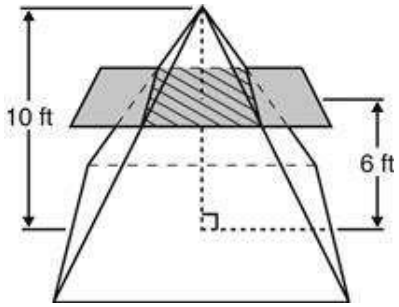
A. $1\frac{3}{8}$ ft

B. 22 ft

C. $37\frac{1}{2}$ ft

D. 46 ft

112. **A square pyramid has a height of 10 feet. A plane parallel to the base of the pyramid is 6 feet above the base as shown below.**



What fraction of the area of the base of the pyramid is the area of the cross-section?

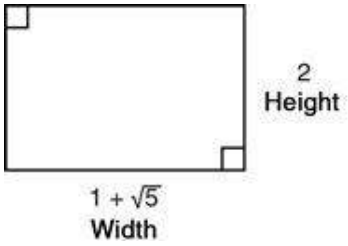
A. $\frac{4}{25}$

B. $\frac{9}{25}$

C. $\frac{2}{5}$

D. $\frac{3}{5}$

113. **An important shape used in art and architecture is the "Golden Rectangle," which has the ratio of the height to the width of $2 : 1 + \sqrt{5}$, as shown below.**



A designer is planning to construct a model of a new building so that the front view is in the shape of a Golden Rectangle with a height of $2\sqrt{2}$ feet. What should be the width of the model?

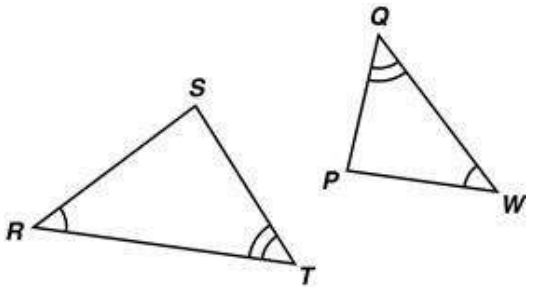
A. $\sqrt{7}$ feet

B. $\sqrt{12}$ feet

C. $(\sqrt{2} + \sqrt{5})$ feet

D. $(\sqrt{2} + \sqrt{10})$ feet

114. **Triangles *RST* and *PQW* are shown below, where $\angle R \cong \angle W$ and $\angle T \cong \angle Q$.**



Which statement about the triangles is valid?

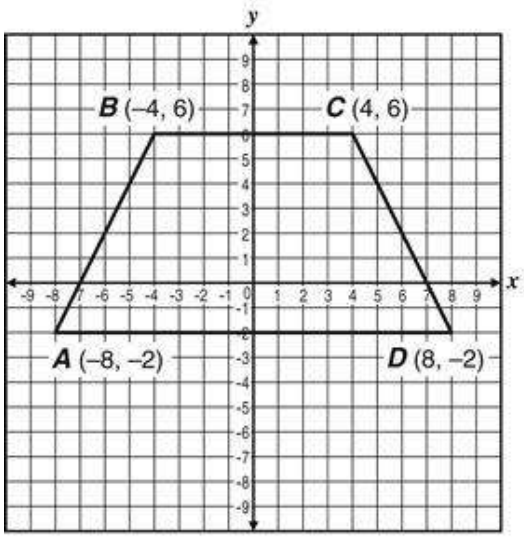
A. $\triangle RST \sim \triangle QPW$

B. $\triangle RTS \cong \triangle WPQ$

C. $\triangle RTS \cong \triangle WQP$

D. $\triangle TRS \sim \triangle QWP$

115. **Trapezoid *ABCD* is plotted on the grid below. A similar trapezoid can be constructed by using two of the points shown and plotting two new points, Points *E* and *F*.**



Which coordinate pairs could represent Point *E* and Point *F*?

A. $(-4, 2)$ and $(4, 2)$

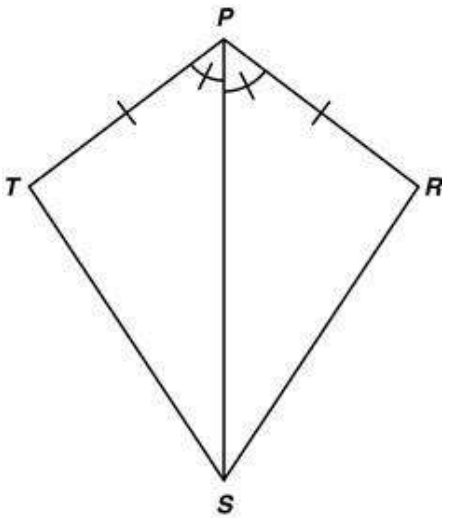
B. $(-3, 3)$ and $(3, 3)$

C. $(-2, 2)$ and $(2, 2)$

D. $(-1, 3)$ and $(3, 3)$

116. **A proof is shown below.**

Given: Quadrilateral *PRST* with $\overline{TP} \cong \overline{PR}$ **and** $\angle TPS \cong \angle SPR$



STATEMENT	REASON
1. Quadrilateral *PRST* with $\overline{TP} \cong \overline{PR}$ and $\angle TPS \cong \angle SPR$	1. Given
2. _____	2. Reflexive Property
3. $\triangle TPS \cong \triangle RPS$	3. SAS Congruence Postulate

STATEMENT	REASON
1. Quadrilateral *PRST* with $\overline{TP} \cong \overline{PR}$ and $\angle TPS \cong \angle SPR$	1. Given
2. _____	2. Reflexive Property
3. $\triangle TPS \cong \triangle RPS$	3. SAS Congruence Postulate

Which statement is justified by Reason 2?

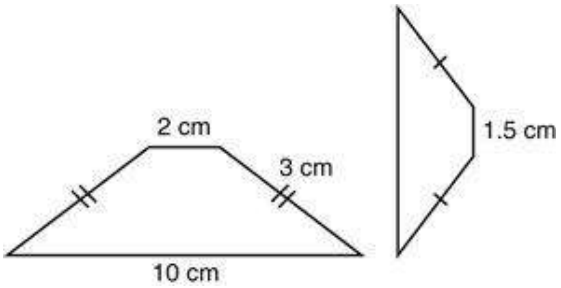
A. $\overline{TS} \cong \overline{TS}$

B. $\overline{PR} \cong \overline{PR}$

C. $\overline{PS} \cong \overline{PS}$

D. $\overline{TR} \cong \overline{TR}$

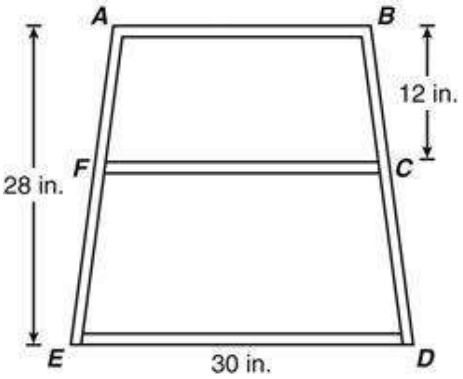
117. **The two isosceles trapezoids shown below are similar. The dimensions are given in centimeters (cm).**



What is the length of each congruent leg of the smaller trapezoid?

A. 0.30 cm
B. 1.00 cm
C. 2.25 cm
D. 3.00 cm

118. **A bookcase is made up of two stacked isosceles trapezoids, with measurements shown below. In the diagram, Trapezoid *ABCF* at the top of the bookcase is similar to Trapezoid *FCDE* on the bottom.**



What is the approximate length of $\overline{FC}$?

A. 11.2 inches
B. 12.9 inches
C. 14.0 inches
D. 22.5 inches

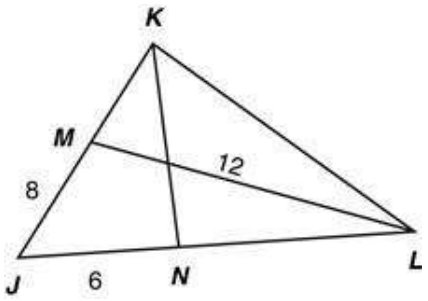
119. **$\triangle QRS$ is similar to $\triangle TUV$. The length of $\overline{QR}$ is 2 centimeters (cm). The length of $\overline{RS}$ is 4 cm. The length of $\overline{TU}$ is 5 cm. What is the length of $\overline{UV}$?**

A. 1.6 cm
B. 2.5 cm
C. 10 cm
D. 11 cm

120. **$\triangle QRS$ is similar to $\triangle TUV$. The length of $\overline{QR}$ is 2 centimeters (cm). The length of $\overline{RS}$ is 7 cm. The length of $\overline{TU}$ is 12 cm. What is the length of $\overline{UV}$?**

A. 1.2 cm
B. 3.4 cm
C. 21 cm
D. 42 cm

121. **In the figure below, $\overline{KN}$ and $\overline{LM}$ are angle bisectors.**



If *LM* = 12, *MJ* = 8, and *JN* = 6, what is the length of $\overline{KN}$?

A. 9
B. 10
C. 12
D. 14

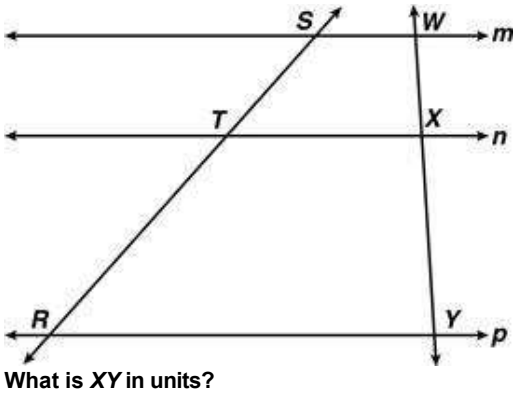
122. **A 6-foot tall person can cast a shadow 8 feet long. At the same time, a nearby building can cast a shadow 48 feet long. How tall is the building?**

A. 36 feet
B. 50 feet
C. 56 feet
D. 64 feet

123. **Two pieces of cloth are shaped like similar triangles. The lengths of the sides of the first piece of cloth are 5 inches, 9 inches, and 12 inches. The length of the shortest side of the second piece of cloth is 15 inches. What is the length of the longest side of the second piece of cloth?**

A. 19 in.
B. 22 in.
C. 27 in.
D. 36 in.

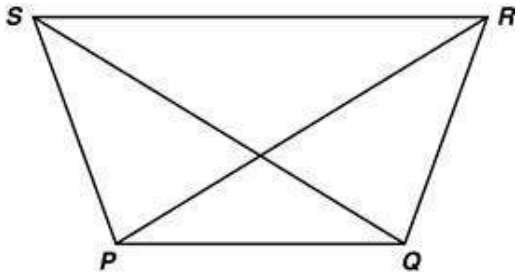
124. **In the figure below, lines *m*, *n*, and *p* are parallel, and *RS* = 12 units, *ST* = 4 units, and *WX* = 3 units.**



What is *XY* in units?

A. 9
B. 7
C. 6
D. 3

125. **In the figure below** $\triangle PSQ \cong \triangle QRP$.



Based on the given information, which statement must be true?

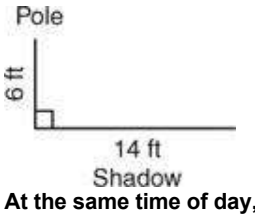
A. $\overline{SQ} \cong \overline{RP}$

B. $\overline{SR} \cong \overline{PQ}$

C. $\angle PSR \cong \angle QSR$

D. $\angle SRP \cong \angle RQS$

126. **A pole 6 feet tall casts a shadow 14 feet long, as shown below.**



At the same time of day, a nearby flagpole casts a shadow 224 feet long. What is the height of the flagpole, in feet?

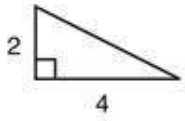
A. 523

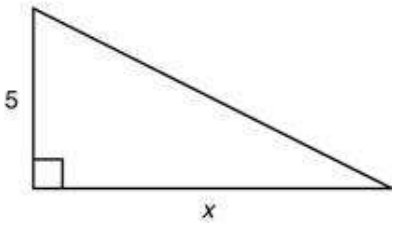
B. 240

C. 216

D. 96

127. **Given that the two right triangles below are similar, what is the value of *x*?**





A. 7

B. 8

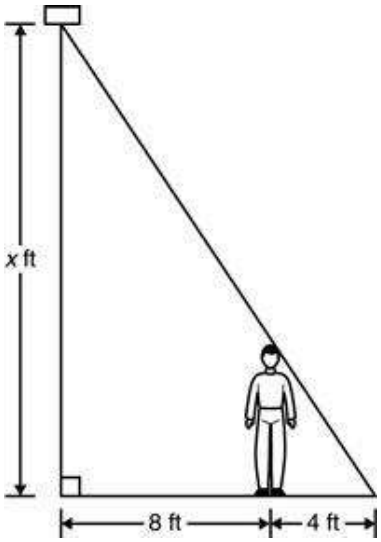
C. 9

D. 10

128. **Eric used two similar cylinder shapes in his art project. One cylinder had a radius of 3.5 inches and a height of 8 inches. If the other cylinder had a radius of 5.25 inches, what was its height?**

A. 9.75 in.
B. 11.5 in.
C. 12 in.
D. 13 in.

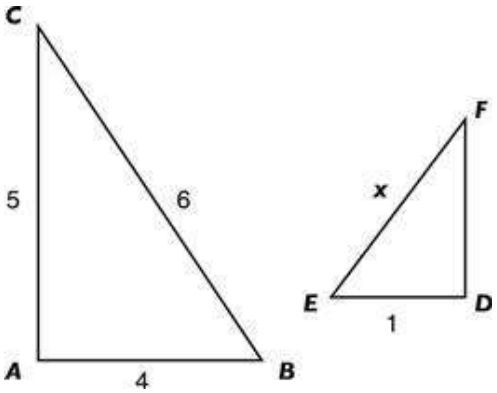
129. **A 6-foot tall man is standing 8 feet from the base of a lamppost, as shown in the diagram.**



If the light from the lamppost casts a 4-foot shadow of the man, what is the height, in feet, of the lamppost?

A. 9
B. 12
C. 14
D. 18

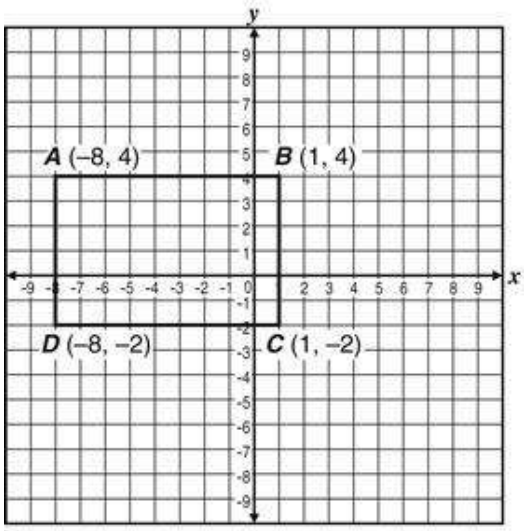
130. **In the figure below,** $\triangle ABC \sim \triangle DEF$.



What is the length of side *X*?

A. $\frac{5}{4}$
B. $\frac{3}{2}$
C. 20
D. 24

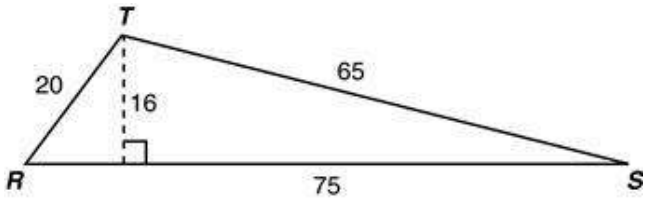
131. **Rectangle *ABCD* is graphed below.**

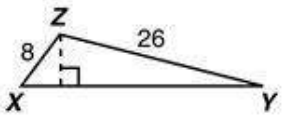


Rectangle *CBEF* is similar but not congruent to *ABCD*. Both rectangles share Side *BC*. Which could be the coordinates of another vertex of Rectangle *CBEF*?

A. $(5, -2)$
B. $(5, -4)$
C. $(7, -2)$
D. $(7, -4)$

132. **In the diagram below, $\triangle RST \sim \triangle XYZ$.**

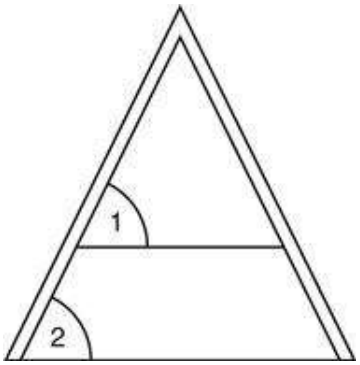




What is the area of $\triangle XYZ$ in square units?

A. 64
B. 96
C. 104
D. 240

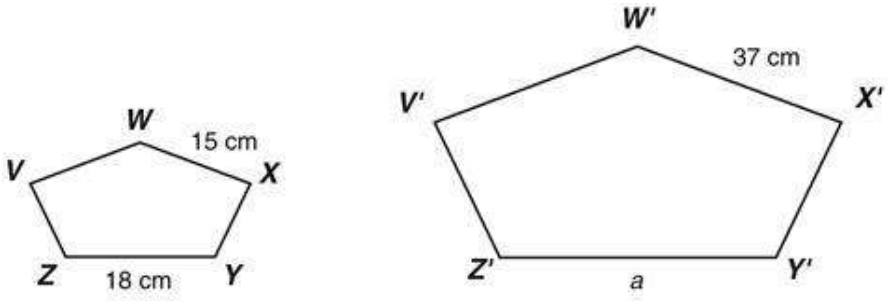
133. **A small vacation home is constructed with two panes of glass on one end as shown below.**



One pane is a triangle, and the other pane is an isosceles trapezoid. Which statement proves that $\angle 1$ and $\angle 2$ are congruent angles?

A. Alternate exterior angles are congruent.
B. Alternate interior angles are congruent.
C. Corresponding angles are congruent.
D. Vertical angles are congruent.

134. **Figure *V′ W′ X′ Y′ Z′* is a dilation of Figure *VWXYZ*.**

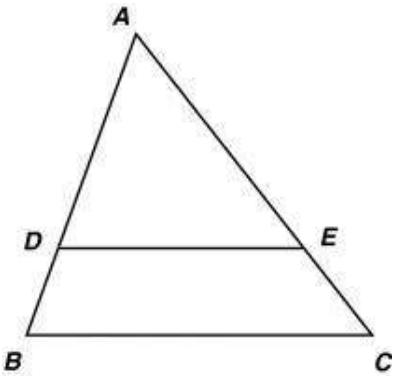


Note: The figures are not drawn to scale.

What is the length of *a* in centimeters?

A. 33.0
B. 36.8
C. 40.0
D. 44.4

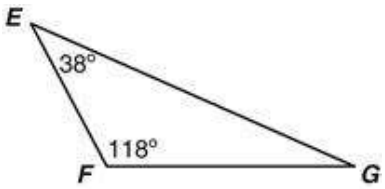
135. **In the figure below, $\overline{DE} \parallel \overline{BC}$.**

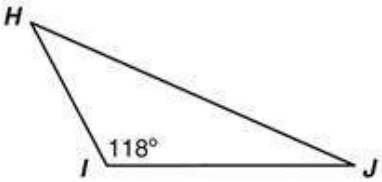


If $\overline{AB} = 12, \overline{AC} = 16$, and $\overline{DB} = 3$, how long is $\overline{AE}$?

A. 12
B. 9
C. 7
D. 4

136. **Triangle *EFG* is congruent to Triangle *HIJ*.**

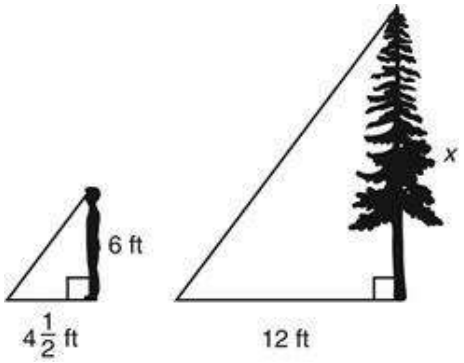




What is the measure of Angle *IJH*?

A. 24°
B. 80°
C. 156°
D. 204°

137. **At 4 p.m. Jack, who is 6 feet tall, casts a shadow $4\frac{1}{2}$ feet long. At the same time, a nearby tree casts a shadow 12 feet long.**



What is the height (*x*) of the tree?

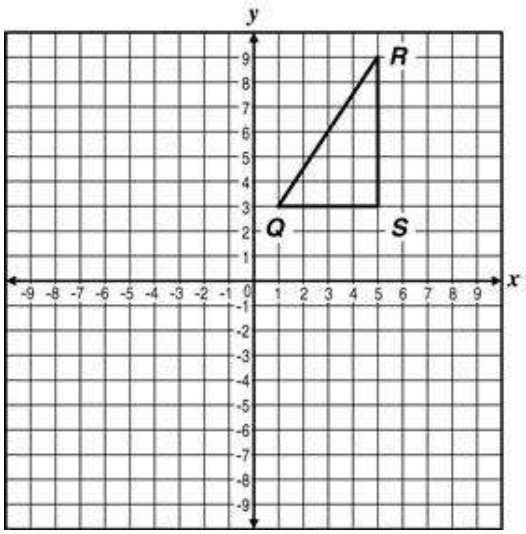
A. 9 feet

B. $13\frac{1}{2}$ feet

C. 16 feet

D. $22\frac{1}{2}$ feet

138. **Triangle *QRS* is shown on the coordinate grid.**



Triangle *QRS* will be dilated centered at point *P*. The sides of the resulting triangle, *Q'R'S'*, will all lie on lines other than those including the sides of *QRS*. Which set of coordinates could represent point *P*?

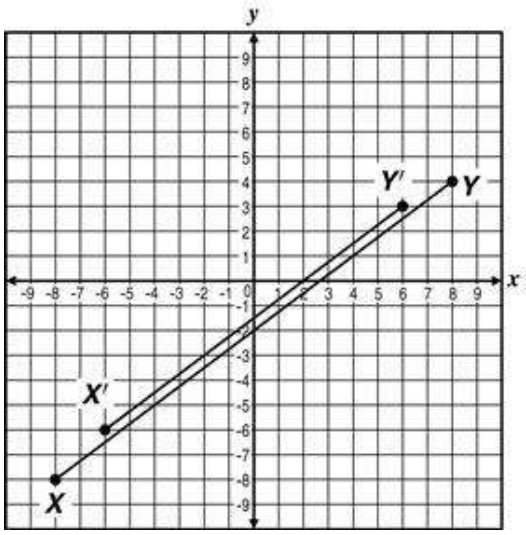
A. $(-5, 3)$

B. $(-3, -3)$

C. $(3, 5)$

D. $(5, -5)$

139. **In the grid, $\overline{X'Y'}$ is the result of dilating $\overline{XY}$ about the origin.**



What scale factor was used in this dilation?

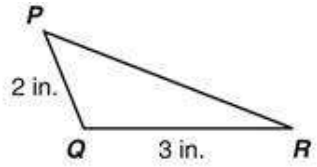
A. $\frac{1}{4}$

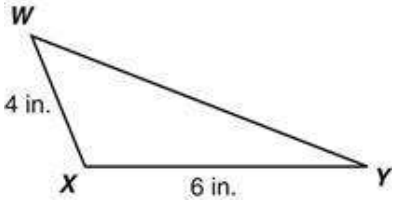
B. $\frac{1}{3}$

C. $\frac{3}{4}$

D. $\frac{4}{3}$

140. **Triangle *PQR* is similar to Triangle *WXY*.**





Which proportion describes the relationship between corresponding sides of the triangles?

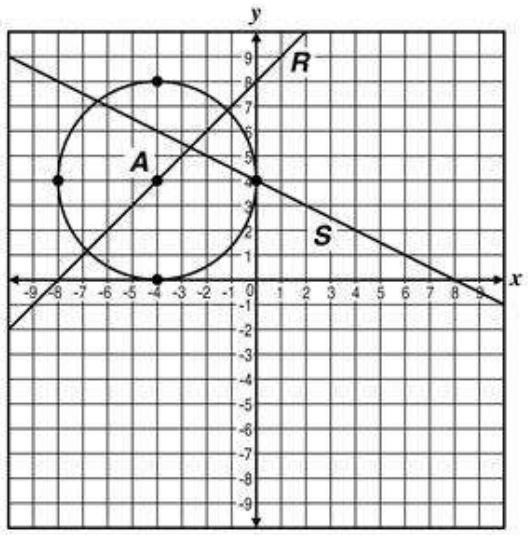
A. $\frac{QR}{XY} = \frac{6}{3}$

B. $\frac{PQ}{WX} = \frac{2}{4}$

C. $\frac{QR}{WX} = \frac{3}{4}$

D. $\frac{PQ}{XY} = \frac{2}{6}$

141. **Line *R* passes through the center of Circle *A*. Line *S* contains a chord of Circle *A*.**



Which set of equations could represent Lines *R* and *S* after Circle *A* is dilated by a scale factor of 0.5?

A. $y = x + 8$
$y = -\frac{1}{2}x + 2$

B. $y = x + 4$
$y = -\frac{1}{2}x + 2$

C. $y = x + 4$
$y = -\frac{1}{2}x + 4$

D. $y = x + 8$
$y = -\frac{1}{2}x + 4$

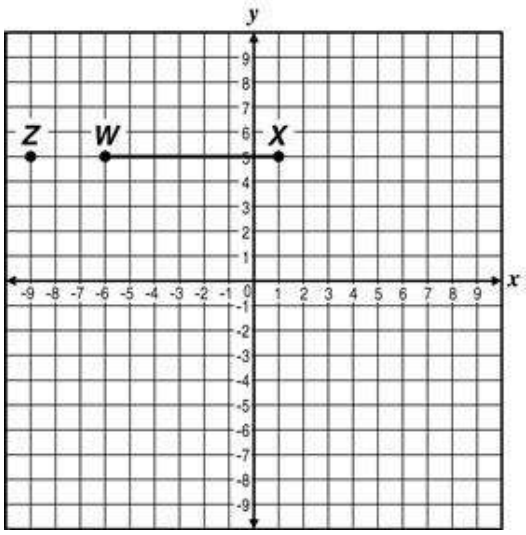
142. **Triangle *XYZ* with Point *X* at $(-2, 4)$ was dilated with the center at the origin to result in Point X' at $(-6, 12)$. Triangle $X'Y'Z'$ was translated 3 units vertically to result in triangle $X''Y''Z''$. Let *p* represent the perimeter, in units, of Triangle *XYZ*. Which expression represents the perimeter, in units, of Triangle $X''Y''Z''$?**

A. $3p$
B. $3p + 3$
C. $9p$
D. $9p + 3$

143. **If the point (4, 7) is dilated by a factor of 10 about the point (1, 2), what are the coordinates of the image?**

A. $(30, 50)$
B. $(31, 52)$
C. $(39, 68)$
D. $(40, 70)$

144. **The line segment *WX* will be dilated by a scale factor of 2 about point *Z* to create line segment *W'X'*.**



What will be the coordinates of point *W'*?

A. $(-12, 10)$

B. $(-3, 5)$

C. $(2, 10)$

D. $(11, 5)$

145.

146.

147.

148.

149.

150.

151.

152.