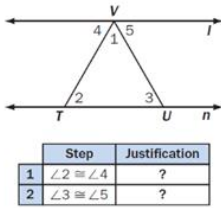


Item 1

Selected-Response: 1 point

In this figure, $l \parallel n$. Jessie listed the first two steps in a proof that shows $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$.



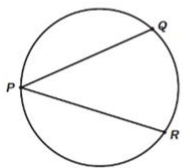
Which justification can Jessie give for Steps 1 and 2?

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

Item 3

Selected-Response: 1 point

In this circle, $m\widehat{QR} = 72^\circ$.



What is $m\angle QPR$?

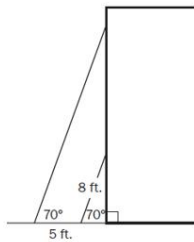
- A. 18°
- B. 24°
- C. 36°
- D. 72°

Item 5

Selected-Response: 1 point

This diagram shows two ladders leaning against a building. Each ladder is leaning at an angle of 70° .

- The length of the short ladder is 8 feet.
- The base of the long ladder is 5 feet farther from the base of the building than the base of the short ladder is.



What is the length, to the nearest foot, of the long ladder?

$$\begin{cases} \sin 70^\circ = 0.9397 \\ \cos 70^\circ = 0.3420 \\ \tan 70^\circ = 2.7475 \end{cases}$$

- A. 10 ft.
- B. 13 ft.
- C. 23 ft.
- D. 26 ft.

Item 7

Selected-Response: 1 point

Look at the coordinates of square $ABCD$.

- $A(-3, 0)$
- $B(2, 4)$
- $C(6, -1)$
- $D(1, -5)$

What is the perimeter of square $ABCD$?

- A. 20 units
- B. $4\sqrt{41}$ units
- C. $2\sqrt{82}$ units
- D. 41 units

Item 2

Selected-Response: 1 point

The points $O(-4, 3)$, $A(x, y)$, and $B(x, 3)$ create a right triangle inside of Circle O . Point A lies on the circle. $OA = 6$ centimeters.

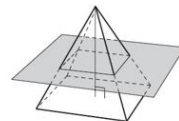
What is the equation of Circle O ?

- A. $(x + 4)^2 + (y - 3)^2 = 6$
- B. $(x - 3)^2 + (y - 3)^2 = 6$
- C. $(x - 3)^2 + (y + 4)^2 = 36$
- D. $(x + 4)^2 + (y - 3)^2 = 36$

Item 4

Selected-Response: 1 point

Look at the square pyramid.



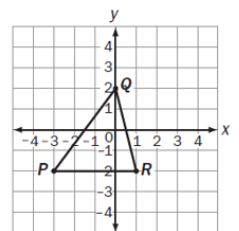
If the plane in the figure is parallel to the base of the pyramid, which BEST describes the shape of the intersection?

- A. a rectangle
- B. a trapezoid
- C. a triangle
- D. a circle

Item 6

Selected-Response: 1 point

Look at the coordinate grid below.



What is the perimeter of $\triangle PQR$?

- A. $4 + \sqrt{42}$
- B. 14
- C. $9 + \sqrt{17}$
- D. 17

Item 8

Selected-Response: 1 point

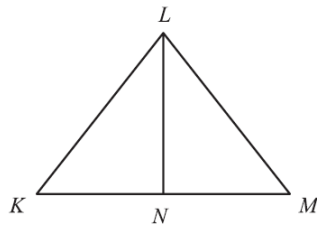
Paul has a spinner with the colors red, green, blue, orange, and purple on it. He also has a six-sided number cube.

The probability of the arrow of the spinner stopping on green is $\frac{1}{5}$ and the probability of getting a number greater than 2 when tossing the number cube is $\frac{4}{6}$.

What is the probability of landing on green and tossing a number greater than 2?

- A. $\frac{2}{15}$
- B. $\frac{3}{10}$
- C. $\frac{7}{10}$
- D. $\frac{13}{15}$

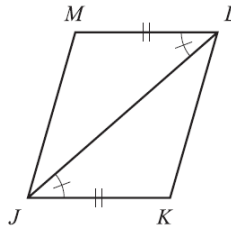
1 In this figure, $\overline{LN} \perp \overline{KM}$.



What information would a student need to prove $\triangle KLN \sim \triangle MLN$?

- A $\angle LKN \cong \angle LMN$
- B $\angle LNK \cong \angle LNM$
- C $\angle KLN \cong \angle LNM$
- D $\angle LKN \cong \angle NLM$

2 This figure shows quadrilateral $JKLM$.



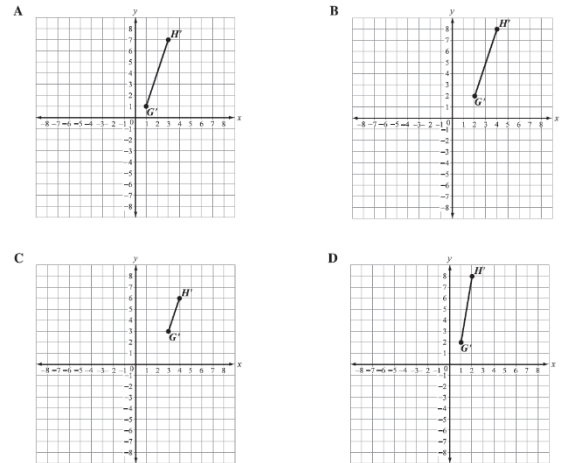
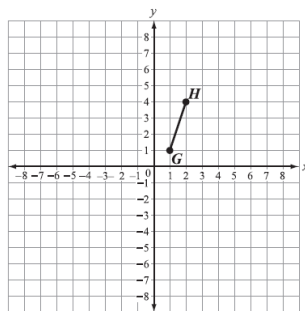
What information will NOT be used to prove that $JKLM$ is a parallelogram?

- A Show that $\angle JLM \cong \angle LJK$.
- B Show that $\overline{JK} \cong \overline{LM}$.
- C Show that $\triangle JKL \cong \triangle LMJ$.
- D Show that $\triangle JKL \cong \triangle JLM$.

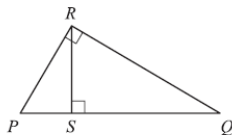
4 Which transformation of $\triangle HIJ$ does NOT result in a congruent triangle?

- A a reflection across the x -axis, followed by a rotation of 180° about the origin
- B a rotation by 180° about the origin, followed by a translation of 2 units left and 3 units down
- C a translation of 1 unit right and 2 units up, followed by a dilation by a factor of 3
- D a dilation by a factor of 2, followed by a dilation by a factor of 0.5

3 Which figure represents the dilation of segment GH about the origin by a scale factor of 2?



5 Use this triangle to answer the question.



This is a proof of the Pythagorean theorem.

Step	Justification
1 $\triangle PQR \sim \triangle RPS \sim \triangle QSR$	AA postulate
2 $\frac{PQ}{QR} = \frac{QR}{SQ}$ and $\frac{PQ}{PR} = \frac{PR}{PS}$	Corresponding sides of similar triangles are congruent
3 $QR^2 = PQ \cdot SQ$ and $PR^2 = PQ \cdot PS$	Multiplication property of equality
4 $QR^2 + PR^2 = PQ \cdot SQ + PQ \cdot PS$	Addition property
5 $QR^2 + PR^2 = PQ(SQ + PS)$	Distributive property
6 $QR^2 + PR^2 = PQ(PQ)$	Segment addition postulate
7 $QR^2 + PR^2 = PQ^2$	Simplify

In which step is there a mistake in the proof?

- A Step 1
- B Step 2
- C Step 4
- D Step 6

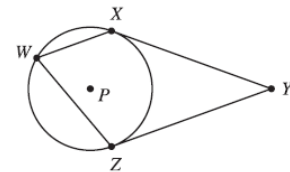
6 Use line segment \overline{HI} to answer the question.



Which step should be first to draw a line perpendicular to \overline{HI} at point J ?

- A Place the compass on point H and set its width to less than \overline{HJ} .
- B Place the compass on point H and set its width to more than \overline{HJ} .
- C Place the compass on point J and set its width to less than \overline{HI} .
- D Place the compass on point J and set its width to more than \overline{HI} .

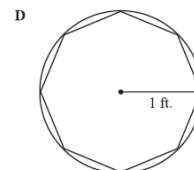
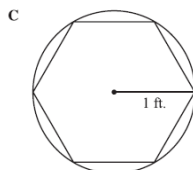
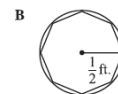
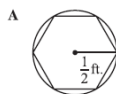
8 Circle P has tangents \overline{XY} and \overline{ZY} and chords \overline{WX} and \overline{WZ} , as shown in this figure. The measure of $\angle ZWX = 70^\circ$.



What is the measure, in degrees, of $\angle XYZ$?

- A 20°
- B 35°
- C 40°
- D 55°

7 Which polygon inscribed in a circle has an area closest to π square feet?



10 The graph of a circle has its center at $(2, 3)$ with a radius of 10 units. Which point does NOT lie on the circle?

- A $(-4, -5)$
- B $(8, 11)$
- C $(-2, 6)$
- D $(-4, 11)$

11 In soccer, a shutout is a game where the winning team does not allow the other team to score a goal.

If the set W represents all wins, and S represents all shutouts, which set describes the set of shutout wins?

- A $W \cap S$
- B $W \cup S$
- C $W' \cap S'$
- D $(W \cup S)'$

12 Which two-way frequency table shows that $P(W|Y) = 0.25$?

A

	Event Y	Event Z	Total
Event W	12	24	36
Event X	36	28	64
Total	48	52	100

B

	Event Y	Event Z	Total
Event W	12	36	48
Event X	26	26	52
Total	38	62	100

C

	Event Y	Event Z	Total
Event W	25	21	46
Event X	12	42	54
Total	37	63	100

D

	Event Y	Event Z	Total
Event W	10	26	36
Event X	40	24	64
Total	50	50	100

13 Which is an equation for the circle with a center at $(-2, 3)$ and a radius of 3?

- A. $x^2 + y^2 + 4x - 6y + 22 = 0$
- B. $2x^2 + 2y^2 + 3x - 3y + 4 = 0$
- C. $x^2 + y^2 + 4x - 6y + 4 = 0$
- D. $3x^2 + 3y^2 + 4x - 6y + 4 = 0$

14 What is the center of the circle given by the equation $x^2 + y^2 - 10x - 11 = 0$?

- A. $(5, 0)$
- B. $(0, 5)$
- C. $(-5, 0)$
- D. $(0, -5)$

15 Bianca spins two spinners that have four equal sections numbered 1 through 4. If she spins a 4 on at least one spin, what is the probability that the sum of her two spins is an odd number?

- A. $\frac{1}{4}$
- B. $\frac{7}{16}$
- C. $\frac{4}{7}$
- D. $\frac{11}{16}$

16 Each letter of the alphabet is written on a card using a red ink pen and placed in a container. Each letter of the alphabet is also written on a card using a black ink pen and placed in the same container. A single card is drawn at random from the container. What is the probability that the card has a letter written in black ink, the letter A, or the letter Z?

- A. $\frac{1}{2}$
- B. $\frac{7}{13}$
- C. $\frac{15}{26}$
- D. $\frac{8}{13}$