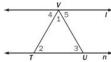
Geometry Milestone Released Items

Item 1

Selected-Response: 1 point

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



	Step	Justification
1	∠2 ≅ ∠4	?
2	∠3 ≅ ∠5	?

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, $\widehat{mQR} = 72^{\circ}$.



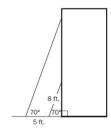
What is m∠QPR?

- A. 18°
- B. 24°
- C. 36°
- D. 72°

Selected-Response: 1 point

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

- 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?

- 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

Name

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 0?

- **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.



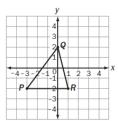
If the plane in the figure is parallel to the base of the pyramid, which BEST describes the shape of the intersection?

- 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?

- B. $\frac{3}{10}$
- c. $\frac{7}{10}$

Technology-Enhanced: 2 points

Triangle ABC is similar but not congruent to triangle DEF.

Which series of transformations could map triangle ABC onto triangle DEF?

- A. translation 4 units up, rotation 75° about the origin
- B. reflection across the line y = 2, rotation 90° about the origin C. translation 3 units left, dilation of scale factor 2 centered at the origin
- D. reflection across the line x = 1, reflection across the line y = 5

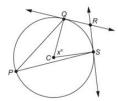
Which equation must be true about triangle ABC and triangle DEF?

- A. AR = DF
- B. AC EF
- C. $m\angle A + m\angle B m\angle D + m\angle F$
- D. $m \angle A + m \angle C m \angle D + m \angle F$

Item 11

Technology-Enhanced: 2 points

The figure shows circle C with tangent lines \overrightarrow{QR} and \overrightarrow{SR} .



The measure of $\angle QCS$ is x° .

Select THREE statements that are true about the figure.

- A. The measure of $\angle QPS$ is $(90 x)^{\circ}$.
- B. The measure of $\angle QPS$ is $\frac{1}{2}x^{\circ}$.
- C. The measure of / PSR is 90°
- D. The measure of ∠CQR is 90°
- E. The measure of $\angle QRS$ is $(180 x)^{\circ}$.
- F. The measure of $\angle QRS$ is $2x^{\circ}$.

Item 13

Extended Constructed-Response: 2 points

Jane and Mark each build ramps to jump their remote-controlled cars.

Both ramps are right triangles when viewed from the side. The incline of Jane's ramp makes a 30-degree angle with the ground, and the length of the inclined ramp is 14 inches. The incline of Mark's ramp makes a 45-degree angle with the ground, and the length of the inclined ramp is 10 inches.

Part A: What is the horizontal length of the base of each ramp? Explain how you found your answers. Write your answers on the lines provided.



Item 10

Multi-Part Technology-Enhanced

Triangle GHJ is a right triangle. Angle G has a measure of g° , angle H has a measure of h° , and angle J

Part A

Which equation must be true?

- A. $sin(h^{\circ}) = sin(g^{\circ})$

- B. $\cos(g^{\circ}) = \sin(h^{\circ})$ C. $\cos(h^{\circ}) = \cos(g^{\circ})$ D. $\sin(h^{\circ}) + \cos(h^{\circ}) = \tan(h^{\circ})$

FYI:
$$tan \theta = \frac{\sin \theta}{\cos \theta}$$

Part B

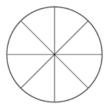
Given that $tan(g^o) = \frac{sin(g^o)}{cos(g^o)}$, which ratio must have a value equivalent to the tangent of g^o ?

- A. $\frac{\cos(h^\circ)}{\sin(g^\circ)}$
- B. $\frac{\cos(h^\circ)}{\sin(h^\circ)}$
- c. $\frac{\sin(h^\circ)}{\cos(h^\circ)}$
- D. $\frac{\sin(h^\circ)}{\cos(g^\circ)}$

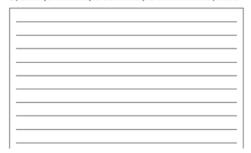
Item 12

Constructed-Response: 2 points

Billy is creating a circular garden divided into 8 equal sections. The diameter of the garden is ${\bf 12}$ feet.

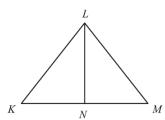


What is the area, in square feet, of one section of the garden? Use $\pi=3.14$. Explain how you determined your answer. Write your answer on the lines provided.



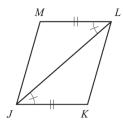
Part B: Which car is launched from the highest point? Explain your reasoning. Write your answer on the lines provided.

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

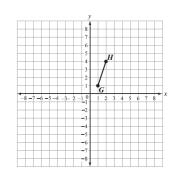


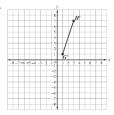
- What information would a student need to prove $\triangle KLN \sim \triangle MLN$?
- $\angle LKN \cong \angle LMN$
- В $\angle LNK \cong \angle LNM$
- C $\angle KLN \cong \angle LNM$
- D $\angle LKN \cong \angle NLM$

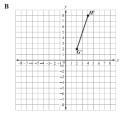
2 This figure shows quadrilateral *JKLM*.



- What information will NOT be used to prove that JKLM is a parallelogram?
- Show that $\angle JLM \cong \angle LJK$.
- Show that $\overline{JK} \cong \overline{LM}$. В
- \mathbf{C} Show that $\triangle JKL \cong \triangle LMJ$.
- D Show that $\triangle JKL \cong \triangle JLM$.
- 3 Which figure represents the dilation of segment GH about the origin by a scale factor of 2?







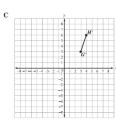
4 Which transformation of $\triangle HIJ$ does NOT result in a congruent triangle?

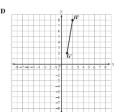
dilation by a factor of 0.5

3 units down

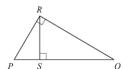
A a reflection across the x-axis, followed by a rotation of 180° about the origin a rotation by 180° about the origin, followed by a translation of 2 units left and

a translation of 1 unit right and 2 units up, followed by a dilation by a factor of 3 a dilation by a factor of 2, followed by a





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

Ľ	QR2	+ PK	-PQ		Sili	пригу			
In	which	sten	is the	re a	mists	ke in	the	proof	

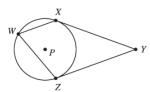
- A Step 1
- Step 2 В
- C Step 4
- D Step 6

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} .
- Place the compass on point H and set its width to more than \overline{HJ} .
- Place the compass $\underline{\text{on}}$ 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} .

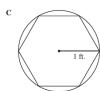
8 Circle \underline{P} has tangents \overline{XY} and \overline{ZY} and chords \overline{WX} and \overline{WZ} , as shown in this figure. The measure of $\angle ZWX = 70^{\circ}$.

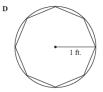


- What is the measure, in degrees, of $\angle XYZ$?
- A 20°
- B 35°
- C 40°
- D 55°
- 7 Which polygon inscribed in a circle has an area closest to $\,\pi\,$ square feet?









- 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)

A

- \mathbf{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'∩S'
- D (W∪S)*

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

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

	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?

В

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 $x^2 + y^2 - 10x - 11 = 0$?

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.** $\frac{7}{10}$
 - 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.** $\frac{8}{13}$