

Geometry STAAR Practice Test A

1 What is the measure of each interior angle of a regular 12-gon?

- A 132° C 180°
 B 150° D 216°

2 Consider the following statements.

A prime number is a natural number that has no positive divisors other than 1 and itself.

The numbers 3, 5, and 7 are prime numbers.

Therefore, all prime numbers are odd numbers.

Which counterexample can be used to show that the conclusion is not always true?

- F 2 H 37
 G 12 J 99

3 Which of the following is an essential difference between Euclidean geometry and spherical geometry?

- A the number of angles in a triangle
 B the existence of right angles
 C the number of degrees in a circle
 D the nature of parallel lines

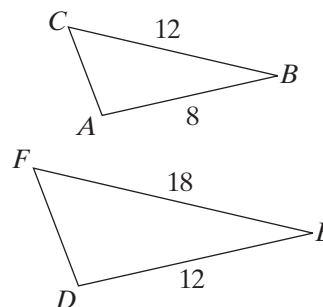
4 A right triangle is drawn on a coordinate grid. One of the two legs can be modeled by the equation $y = 2x + 5$. Which equation could model the other leg of the right triangle?

- F $y = \frac{1}{2}x + 1$
 G $y = -\frac{1}{2}x + 2$
 H $y = -2x + 4$
 J $y = -2x - 1$

5 When the ordered pairs $A(1, 1)$, $B(3, 5)$, $C(7, 5)$, and $D(9, 1)$ are connected, what needs to be true in order to prove $ABCD$ is a trapezoid?

- A The slopes of exactly one pair of line segments must be negative reciprocals.
 B The slopes of exactly one pair of line segments must be reciprocals.
 C The slopes of exactly one pair of line segments must be the same.
 D The slopes of exactly one pair of line segments must be zero.

6 $\triangle ABC$ and $\triangle DEF$ are similar.



Which of the following must be true about the similar triangles?

- F $m\angle E = m\angle C$
 G $m\angle F = m\angle A$
 H $\frac{BC}{EF} = \frac{AB}{FD}$
 J The perimeter of $\triangle DEF$ is 1.5 times the perimeter of $\triangle ABC$.

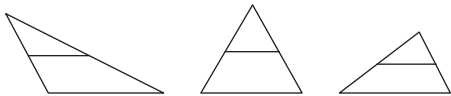
- 7** The sum of the interior angles of a triangle is 180° . The sum of the interior angles of a quadrilateral is 360° . The sum of the interior angles of a pentagon is 540° . Use what you know about the sum of the interior angles of a triangle, quadrilateral, and pentagon. What is the sum, in degrees, of the interior angles of a hexagon?

Record your answer and fill in the bubbles on your answer document.

- 8** A circle centered at $(-1, 3)$ passes through the point $(4, 6)$. What is the approximate circumference of the circle?

- F** 18.3 units
- G** 36.6 units
- H** 29.8 units
- J** 59.6 units

- 9** Three triangles and their midsegments are shown.



What conjecture can you make about the midsegment of a triangle?

- A** A midsegment between two sides of a triangle is perpendicular to the third side and is half the length of the third side.
- B** A midsegment between two sides of a triangle is parallel to the third side and is half the length of the third side.
- C** A midsegment between two sides of a triangle is perpendicular to the third side and is twice the length of the third side.
- D** A midsegment between two sides of a triangle is parallel to the third side and is twice the length of the third side.

- 10** The orthocenter of a triangle is the point where the altitudes of a triangle intersect. Which set of steps shows how to construct the orthocenter of a triangle?

- F** Construct the angle bisector of each vertex of the triangle. The point where the lines intersect is the orthocenter.
- G** Construct a line perpendicular to each side of the triangle that passes through the opposite vertex. The point where the lines intersect is the orthocenter.
- H** Construct a line perpendicular to each side of the triangle through the midpoint of the side. The point where the lines intersect is the orthocenter.
- J** Construct a line through the midpoint of each side of the triangle through the opposite vertex. The point where the lines intersect is the orthocenter.

- 11** Using the Law of Detachment and the given statements, what is the conclusion?

If a person is on the company's payroll, then the person is an employee.

Jackson is on the company's payroll.

- A** Jackson might be an employee.
- B** Jackson used to be an employee.
- C** Jackson is an employee.
- D** Jackson is not an employee.

GO ON

12 What is the equation of the line that passes through the point $(-8, 2)$ and is perpendicular to the line $y = -2x + 6$?

F $y = 2x + 10$

G $y = 2x + 18$

H $y = \frac{1}{2}x + 6$

J $y = \frac{1}{2}x + 10$

13 The table below relates the number of sides of a polygon to the number of diagonals.

Number of Sides, n	Number of Diagonals
4	2
5	5
6	9
7	14
8	20
9	27
10	35

Which expression can you use to find the number of diagonals in a polygon?

A $2n$

B $2n + 1$

C $\frac{n-2}{2}$

D $\frac{n(n-3)}{2}$

14 What is the cross section formed by a plane intersecting a sphere?

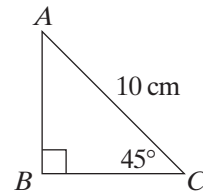
F circle

H triangle

G square

J rectangle

15 Triangle ABC is shown below.



Approximately how much longer is \overline{AC} than \overline{AB} ?

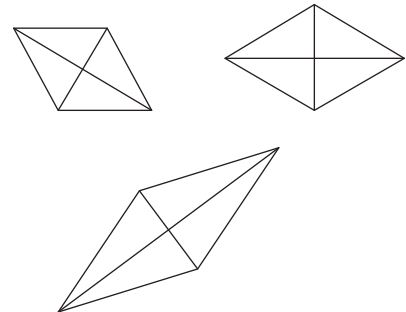
A 2 cm

B 3 cm

C 5 cm

D 7 cm

16 Three rhombuses and their diagonals are shown.



What conjecture can be made about the diagonals of a rhombus?

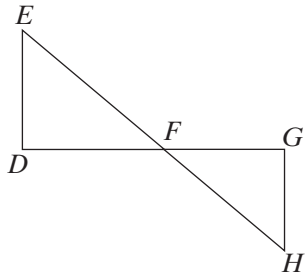
F One diagonal of a rhombus is two times longer than the other diagonal.

G The diagonals of a rhombus are congruent.

H The diagonals of a rhombus are parallel to each other.

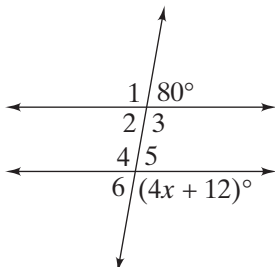
J The diagonals of a rhombus are perpendicular to each other.

- 17 In the figure below, \overline{DE} is parallel to \overline{GH} .



If the perimeter of $\triangle DEF$ is 22 mm, $DF = 8$ mm, and $FG = 4$ mm, what is the perimeter of $\triangle GHF$?

- A 11 mm
 - B 16 mm
 - C 22 mm
 - D 44 mm
- 18 What is the value of x ?



- F 100
- G 88
- H 28
- J 22

- 19 Damon's cup is in the shape of a cylinder. The height of the cup is 6 inches and the base has a diameter length of 2.5 inches. Damon fills the cup three-fourths full of water. How much water, in cubic inches, is in the cup? Use 3.14 for π . Round to the nearest hundredth.

Record your answer and fill in the bubbles on your answer document.

- 20 A line segment has endpoints of $(-2, 6)$ and $(-4, -9)$. What is the midpoint of the line segment?
- F $(3, -7.5)$
 - G $(-3, 7.5)$
 - H $(-3, -1.5)$
 - J $(-3, 1.5)$

- 21 Let points $A, B, C, D,$ and E be collinear. Let B be the midpoint of \overline{AC} , let C be the midpoint of \overline{BD} , and let D be the midpoint of \overline{CE} . What justification can you use to fill in the blank to prove that C is the midpoint of \overline{AE} ?

Because $B, C,$ and D are the midpoints of $\overline{AC}, \overline{BD},$ and $\overline{CE},$ respectively, you know that $AB = BC, BC = CD,$ and $CD = DE.$ By the _____?_____, $AB = DE.$ By the Addition Property of Equality, $AB + BC = CD + DE.$ But $AB + BC = AC$ and $CD + DE = CE,$ so $AC = CE.$ Therefore, C is the midpoint of $\overline{AE}.$

- A Reflexive Property of Equality
- B Transitive Property of Equality
- C Substitution Property
- D Symmetric Property of Equality



- 22** Using the Law of Syllogism and the given statements, what is the conclusion?

If a quadrilateral is a square, then it has four congruent sides.

If a quadrilateral has four congruent sides, then it is a rhombus.

- F** If a quadrilateral is a rhombus, then it is a square.
G If a quadrilateral is a square, then it is a rhombus.
H If a quadrilateral has four congruent sides, then it is not a square.
J If a quadrilateral has four congruent sides, then it is not a rhombus.

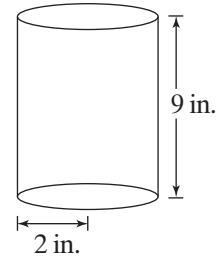
- 23** How many faces does a polyhedron have if it has 8 vertices and 12 edges?

- A** 2
B 6
C 14
D 26

- 24** The volume of a rectangular prism is 400 cm^3 . If each dimension of the rectangular prism is doubled, how is the volume affected?

- F** The volume is doubled.
G The volume is multiplied by 4.
H The volume is multiplied by 8.
J The volume is multiplied by 16.

- 25** What is the approximate total surface area of the cylinder shown below? Use 3.14 for π . Round to the nearest tenth.



- A** 452.2 in.^2
B 251.1 in.^2
C 138.2 in.^2
D 113.0 in.^2

- 26** If $\angle C$ and $\angle D$ are supplementary angles and the measure of $\angle D$ is f , which equation can be used to find e , the measure of $\angle C$?

- F** $e = 90 - f$
G $e = 180 + f$
H $e = 90 + f$
J $e = 180 - f$

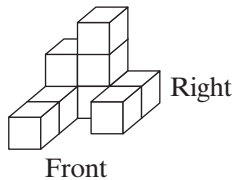
- 27** A ten-foot ladder is placed on the side of a house. The distance between the base of the ladder and the house is 5 feet. How far up the house, in feet, does the ladder reach? Round to the nearest tenth.

Record your answer and fill in the bubbles on your answer document.

28 Triangle CDE is congruent to triangle LMN . Which side is congruent to \overline{LN} ?

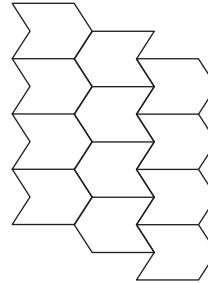
- F \overline{CD}
- G \overline{DE}
- H \overline{CE}
- J \overline{LM}

29 Which of the following best represents the front view of the figure shown below?



- A
- B
- C
- D

30 What transformation(s) are used to make the pattern shown below from one of its hexagonal tiles?

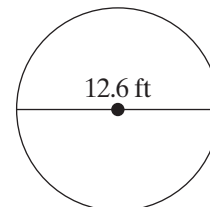


- F Translation only
- G Translation and reflection
- H Reflection only
- J Rotation only

31 Triangle ABC is a 30° - 60° - 90° triangle. If triangle $A'B'C'$ is the result of reflecting triangle ABC over the x -axis, what are the angle measures of triangle $A'B'C'$?

- A 20° - 70° - 90°
- B 60° - 60° - 60°
- C 45° - 45° - 90°
- D 30° - 60° - 90°

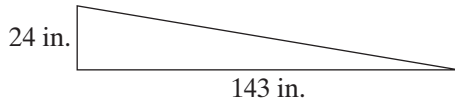
32 Dean has a table with a circular top. What is the area, in square feet, of the table top? Use 3.14 for π . Round your answer to the nearest tenth.



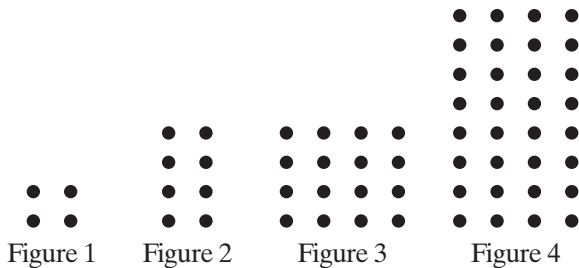
Record your answer and fill in the bubbles on your answer document.



- 33 Kristy is building a ramp. The right face of the ramp is in the shape of a right triangle. The base length and height of the ramp are shown. What is the distance along the inclined portion of the ramp?

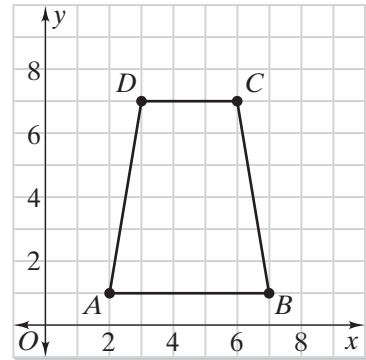


- A 119 in.
 B 141 in.
 C 145 in.
 D 167 in.
- 34 Which equation represents the pattern, where x is the figure number and y is the number of dots in the figure?



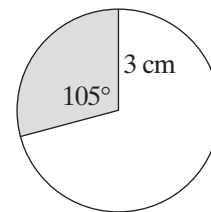
- F $y = 4x$
 G $y = 4x + 1$
 H $y = 2^x$
 J $y = 2^x + 1$

- 35 Trapezoid $ABCD$ is graphed on the coordinate plane shown below.



Which set of coordinates represents the vertices of a trapezoid congruent to trapezoid $ABCD$?

- A (13, 2), (14, 2), (11, 8), (16, 8)
 B (3, 6), (3, 9), (9, 7), (9, 10)
 C (8, 4), (14, 5), (8, 9), (14, 8)
 D (14, 5), (17, 5), (12, 11), (19, 11)
- 36 What is the approximate area of the shaded region below? Use 3.14 for π . Round to the nearest tenth.



- F 4.4 cm^2
 G 8.2 cm^2
 H 16.5 cm^2
 J 28.3 cm^2

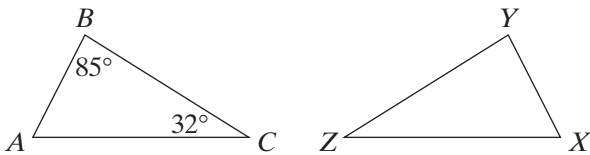
37 The following points can be used to determine several lines:

$A(3, -9), B(0, -2), C(4, 5),$
 $D(5, 19), F(-2, 20), G(12, 19)$

Which line is perpendicular to \overleftrightarrow{AC} ?

- A \overleftrightarrow{BC} C \overleftrightarrow{DF}
 B \overleftrightarrow{CD} D \overleftrightarrow{FG}

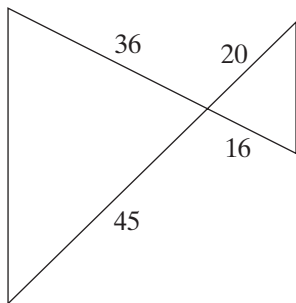
38 $\triangle ABC \cong \triangle XYZ$



What is the measure of $\angle X$?

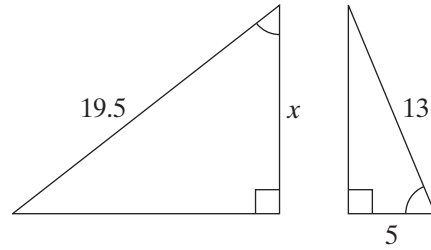
- F 32°
 G 63°
 H 85°
 J 180°

39 If the triangles are similar, which theorem or postulate proves they are similar?



- A AA Postulate
 B SAS Theorem
 C SSS Theorem
 D The triangles are not similar.

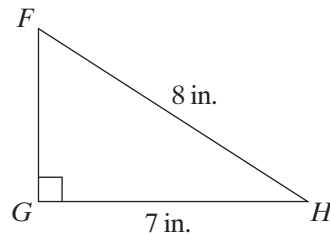
40 The triangles shown are similar.



What is the value of x ?

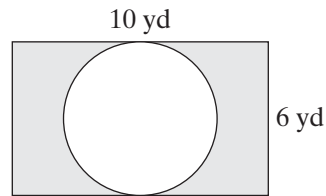
Record your answer and fill in the bubbles on your answer document.

41 In the triangle shown below, what is the approximate length of \overline{FG} ?



- A 10.6 in. C 3.9 in.
 B 5.5 in. D 1.0 in.

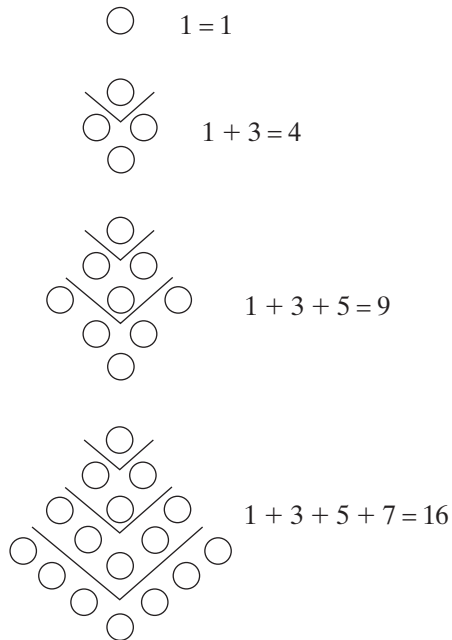
42 A circle is drawn inside a rectangle. Point L in the rectangle is chosen at random. What is the probability that point L lies in the shaded region? Use 3.14 for π . Round to the nearest percent.



- F 11% H 53%
 G 47% J 89%

GO ON

43 Look at the following progression of figures.



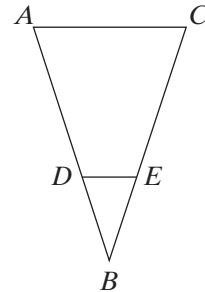
Based on this pattern, what do you think is an expression for the sum of the first n odd numbers?

- A n^2
- B $3n$
- C $\frac{2n(n+1)}{3}$
- D $(n+1)(2n+1)$

44 The midpoint of \overline{JK} is $(-4, 1)$. If J has coordinates $(6, 2)$ and K has coordinates (x, y) , which equation can be used to find x ?

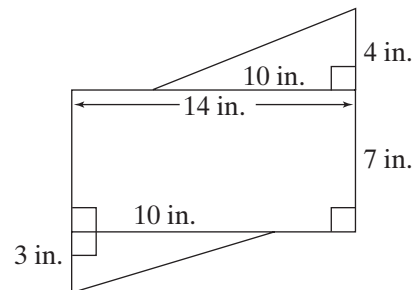
- F $x = (-4)(2) - 6$
- G $x = (-4)(2) + 6$
- H $x = (6 - 4) \div 2$
- J $x = (6 + 4) \div 2$

45 In the figure below, \overline{AC} is parallel to \overline{DE} and \overline{BC} is three times as long as \overline{BE} . Which of the following statements is true?



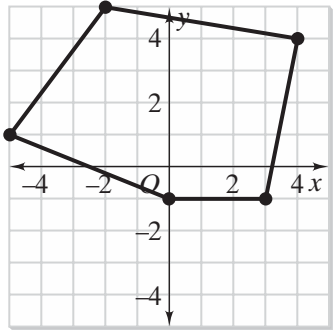
- A $\triangle DBE$ has three times the area of $\triangle ABC$.
- B \overline{AC} is three times the length of \overline{AD} .
- C \overline{AD} is three times the length of \overline{BE} .
- D \overline{AC} is three times the length of \overline{DE} .

46 What is the area of the figure shown below?



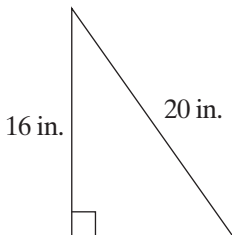
- F 196 in.^2
- G 138 in.^2
- H 133 in.^2
- J 98 in.^2

47 Which set of ordered pairs contains only coordinates of vertices of the polygon graphed below?



- A $\{(-2, 5), (-5, 1), (-1, 0)\}$
- B $\{(1, -5), (4, 4), (-1, 3)\}$
- C $\{(3, 1), (-2, -5), (0, 1)\}$
- D $\{(-5, 1), (0, -1), (3, -1)\}$

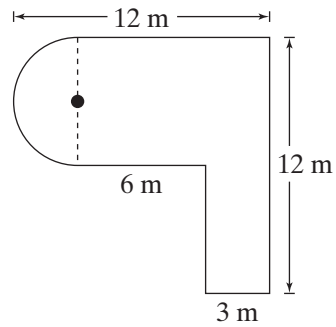
48 Craig has a carpet remnant with the dimensions shown below.



What is the area of this remnant?

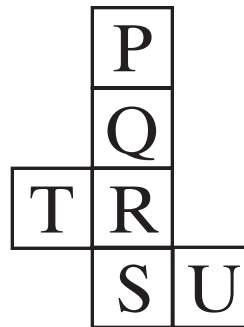
- F 96 in.^2
- G 160 in.^2
- H 192 in.^2
- J 320 in.^2

49 What is the area of the figure? Use 3.14 for π . Round to the nearest hundredth.



- A 68.13 m^2
- B 82.26 m^2
- C 86.13 m^2
- D 100.26 m^2

50 The net below shows the surface of a cube.



Which letter is on the face parallel to the face with the letter Q?

- F R
- G S
- H T
- J U

.....

51 Right triangle DEF has side lengths of 9 feet, 40 feet, and 41 feet. Which of the following are side lengths of a triangle similar to triangle DEF ?

- A** 7 ft, 24 ft, 25 ft
- B** 8 ft, 15 ft, 17 ft
- C** 11.25 ft, 50 ft, 61.5 ft
- D** 22.5 ft, 100 ft, 102.5 ft

52 A cone has a volume of 35 cm^3 . If the radius of the cone is doubled and the height is held constant, what will be the new volume of the cone?

- F** 280.0 cm^3
- G** 219.8 cm^3
- H** 140.0 cm^3
- J** 70.0 cm^3

