Form A

Choose the correct answer to each question and mark it on the Google form. You may use a calculator. You may write on this test.

1. Select the geometric figure that possesses all of the following characteristics:

i. Four equal sides ii. Both pairs of opposite sides are parallel iii. Does not contain a right angle

A) isosceles triangle
B) square
C) parallelogram
D) rhombus

2. Which of the following statements is false?

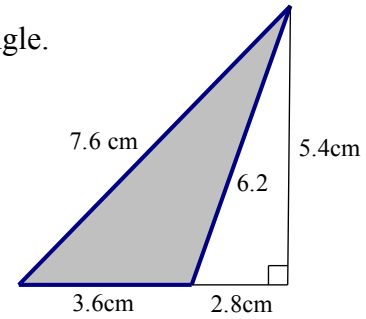
A) A square is a rectangle.
B) A rhombus is a parallelogram.
C) A quadrilateral is a polygon with four equal sides.
D) A rectangle is a parallelogram.

3. In rhombus $ABCD$, $AB = 10$ and $AC = 15$. Find BD to the nearest tenth.

A) 13.2
B) 22.4
C) 24.5
D) 15.5

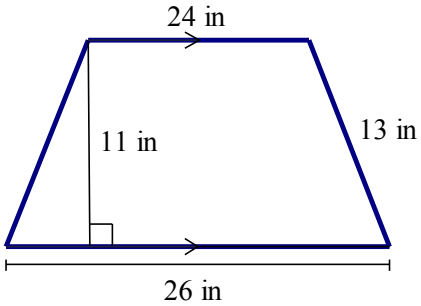
4. Find the area of the shaded triangle.

A) 9.72 cm^2
B) 17.28 cm^2
C) 19.44 cm^2
D) 11.16 cm^2



5. Find the area.

A) 325 in^2
B) 650 in^2
C) 275 in^2
D) 550 in^2



6. A rectangular piece of fabric measures 42 in. by 44 in. A triangular scarf with a height of 31 in. and a base of 30 in. is cut from the fabric. How much is left over?

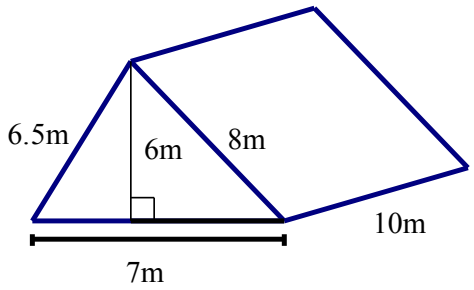
A) 459 in^2
B) 1383 in^2
C) 918 in^2
D) 2766 in^2

7. Find the surface area of a rectangular cuboid that is 14 inches long, 8 inches wide, and 5 inches high.

A) 444 in^2
B) 544 in^2
C) 560 in^2
D) 344 in^2

8. Find the volume of the triangular prism.

A) 260 m^3
B) 210 m^3
C) 420 m^3
D) 257 m^3



9. A point P has coordinates $(-2, 8)$. What are its new coordinates after point P is reflected over the x-axis?

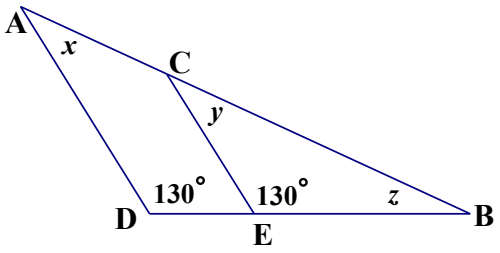
A) $(-2, -8)$
B) $(2, -8)$
C) $(2, 8)$
D) $(-2, 8)$

10. What is the image of A$(-7, -4)$ after the translation$\langle 1, -2 \rangle$?

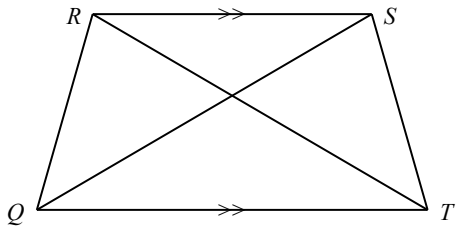
A) $(-6, -6)$
B) $(-8, -6)$
C) $(-8, -2)$
D) $(-6, -2)$

11. Which statement is true for the pictured triangles?

A) $\frac{CE}{AD} = \frac{AB}{CB}$
B) $m\angle x = m\angle y$
C) $m\angle x = m\angle z$
D) None of these statements



12. $QS = 3x + 4$ and $RT = 8x - 10$. Find the value of x so that $QRST$ is isosceles.



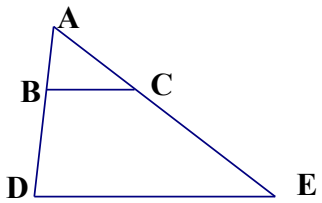
A) $x = 2.8$
B) $x = 2$
C) $x = 0.8$
D) $x = 2.4$

13. Suppose that the orthocenter lies outside of a triangle. What points of concurrency are inside the triangle?

1. incenter 2. circumcenter 3. centroid

A: 1 and 2 only
B: 2 and 3 only
C: 1 and 3 only
D: 1, 2, and 3

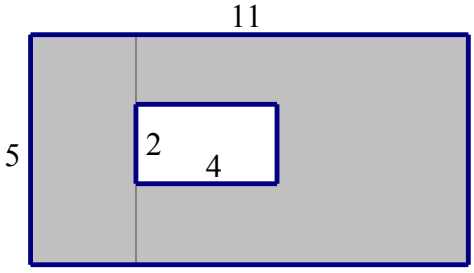
14. In the figure shown, $\overline{BC} \parallel \overline{DE}$, $AB = 7$ yards, $BC = 8$ yards, $AE = 44$ yards, and $DE = 32$ yards. Find CE.



A) 21 yd
B) 11 yd
C) 33 yd
D) 28 yd

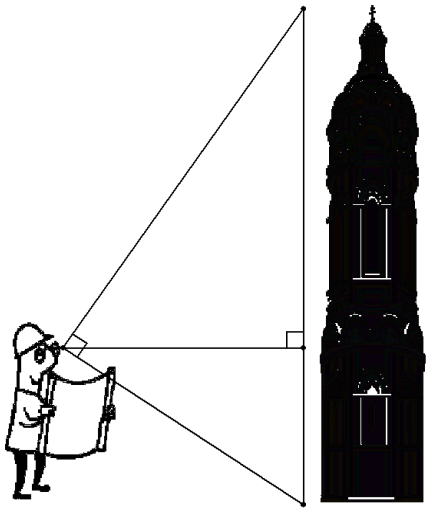
15. If a point is selected at random, what is the probability that it will lie within the shaded rectangular region rather than the unshaded rectangular region?

A) $\frac{1}{2}$
B) $\frac{47}{55}$
C) $\frac{1}{5}$
D) $\frac{8}{55}$



16. An Architect wants to know the approximate height of a tower. She stands so that her eye line makes a right angle when looking at the top and the bottom of the building. If the architect is 54 ft from the base of the building and her eyes are at a height of 5 ft, then what is the height of the building?

A) 270 ft
B) 54.2 ft
C) 583.2 ft
D) 588.2 ft

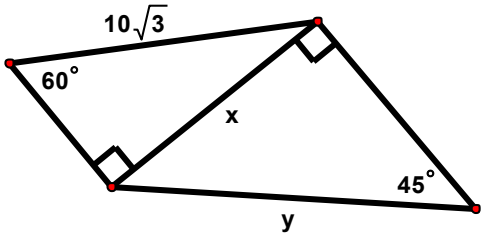


17. The shorter leg of a 30^o–60^o–90^o triangle is 7.3 feet long. Find the perimeter in feet.

A) $(21.9+7.3\sqrt{2})\,ft$
B) $(14.6+7.3\sqrt{2})\,ft$
C) $(21.9+7.3\sqrt{3})\,ft$
D) $(14.6+7.3\sqrt{3})\,ft$

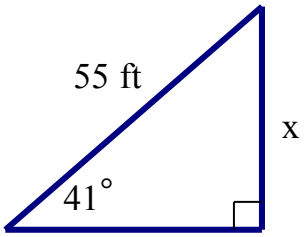
18. Find x and y

A) $x=5\sqrt{6}, y=10\sqrt{3}$
B) $x=15, y=15\sqrt{2}$
C) $x=15, y=15\sqrt{3}$
D) $x=5\sqrt{3}, y=5\sqrt{6}$



19. A photographer shines a camera light at a particular painting forming an angle of 41^o with the camera platform. If the light shines 55 feet to where the bottom of painting hangs, how high above the platform is the painting?

A) 83.83 ft.
B) 47.81 ft.
C) 41.51 ft.
D) 36.08 ft.



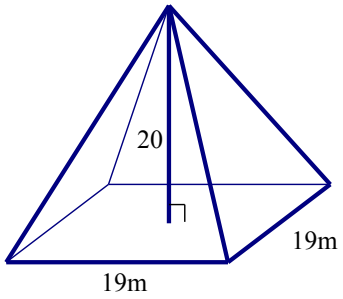
20. A ranger spots a fire while on a 33.25 meter observation tower. The angle of depression from the tower to the fire is 17°. To the nearest meter, how far is the fire from the base of the tower?

A) 105 m
B) 10 m
C) 109 m
D) 33 m

21. Find the exact total surface area of a cone that has a slant height of 20 inches and a radius of 6 inches.

A) 312π in^2
B) 720π in^2
C) 156π in^2
D) 240π in^2

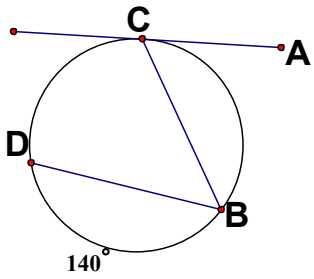
22. Calculate the volume of the pyramid in cubic meters.



A) 7220 m^3
B) $267\frac{11}{27}$ m^3
C) $19\frac{1}{3}$ m^3
D) $2406\frac{2}{3}$ m^3

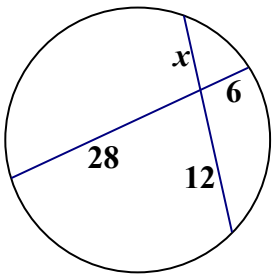
23. Find the measure of $\angle DBC$ if $m\angle ACB = 60°$. Assume $\overline{AC}$ is tangent. The figure is NOT drawn to scale.

A) 80°
B) 50°
C) 100°
D) 160°



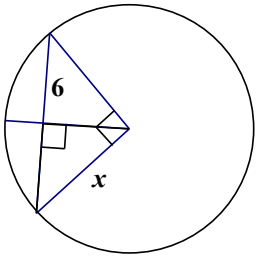
24. Solve for x.

A) 12
B) 21
C) 8
D) 14



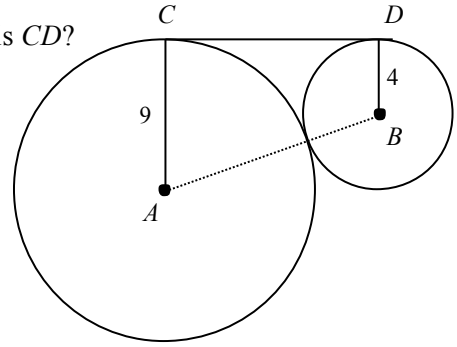
25. Solve for x.

A) 12
B) $6\sqrt{2}$
C) 6
D) none of these



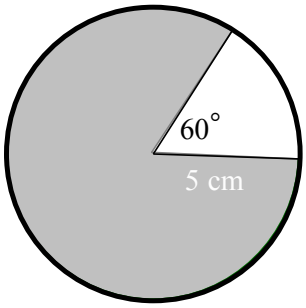
26. $\odot A$ has radius 9, $\odot B$ has radius 4, and $\overline{CD}$ is a common tangent. What is *CD*?

A) *CD* = 13
B) *CD* = 12
C) *CD* = 12.5
D) *CD* = 13.3



27. Find the area of the shaded region in square centimeters.

A) 65.45 cm^2
B) 78.54 cm^2
C) 13.09 cm^2
D) 19.64 cm^2

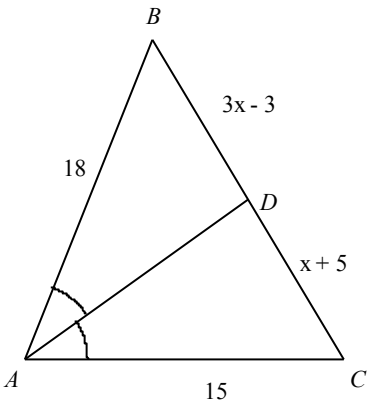


28. Find the volume, in cubic feet, of a sphere 14 ft. in diameter.

A) 11494.04 ft^3
B) 1436.76 ft^3
C) 615.75 ft^3
D) 2463.01 ft

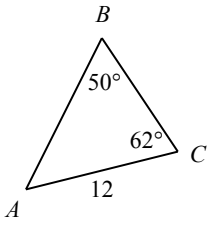
29. Find *BD*.

A) BD= 5
B) BD= 10
C) BD= 22
D) BD= 12



30. Find AB. Round to the nearest tenth.

A) $AB = 13.8$
B) $AB = 33.8$
C) $AB = 10.4$
D) $AB = 14.5$

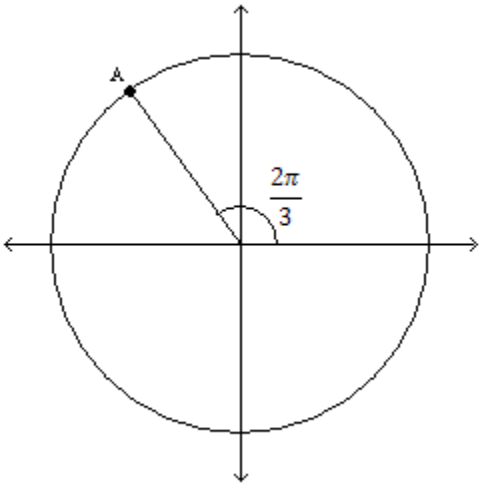


31. The revolving restaurant on top of a hotel in San Francisco, California takes 45 minutes to complete a full rotation. A table that is 30 ft from the center of the restaurant starts at position (30, 0). What are the coordinates of the table after 9 minutes? Round to the nearest tenth.

A) (9.3, 28.5)
B) (23, 19.3)
C) (28.5, 9.3)
D) (11.3, 17.3)

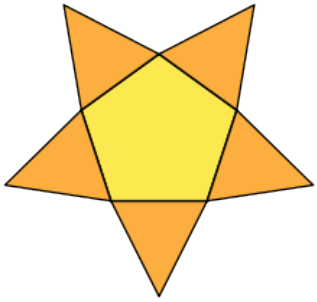
32. Use the unit circle to find the coordinates of point A.

A) $\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right)$
B) $\left(\frac{-\sqrt{3}}{2}, \frac{1}{2}\right)$
C) $\left(\frac{-\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
D) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$



33. Which description best fits this solid?

A: Hexagonal Pyramid
B: Pentagonal Pyramid
C: Hexagonal Triangle
D: Pentagonal Triangle
E: Pentagonal Prism



34. A plane faces heavy crosswinds when traveling from New York to London. The plane's velocity and the wind's velocity are expressed by vectors below.

$v_{plane} = 500i + 142j$ $v_{wind} = -50i - 14j$

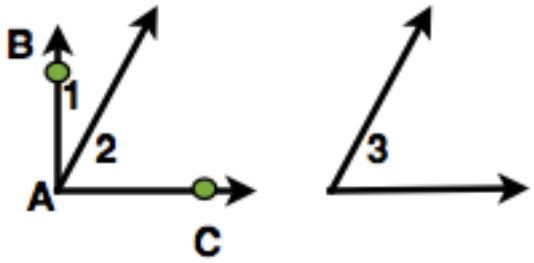
What is the magnitude and direction of the vector for this plane?

A: 472; 24º
B: 467; 16º
C: 572; 8º
D: 523; 14º
E: 470; 12º

35.

Given: ∠BAC is a right angle. ∠2 ≅ ∠3

Prove: ∠1 and ∠3 are complementary



Statement	Reason
1.) ∠BAC is a right angle	**Given**
2.) m∠BAC = 90º	**Definition of a Right Angle**
3.) m∠1 + m∠2 = m∠BAC	**Angle Addition Postulate**
4.) m∠1 + m∠2 = 90º	**Substitution**
5.) ∠2 ≅ ∠3	**Given**
6.) m∠2 = m∠3	**Definition of Congruent Angles**
7.) m∠1 + m∠3 = 90º	**Substitution**
8.) ∠1 and ∠3 are complementary _____	

What is the best reason for the 8th step of this Geometric proof?

A: Substitution
B: Angle Addition Postulate
C: Definition of an Angle Bisector
D: Definition of a Right Angle
E: Definition of Complementary Angles

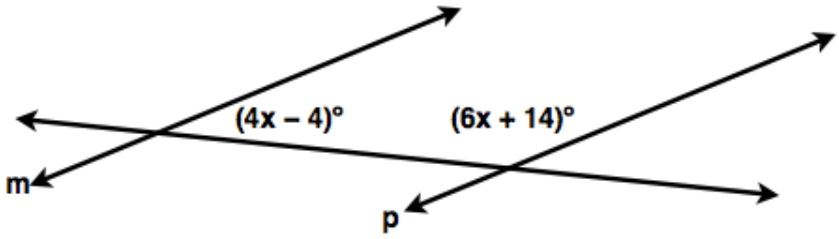
36. What is the converse for the following inverse: "If a polygon does not have 9 sides, then it is not a nonagon."

A: If a polygon is a nonagon, then it has 9 sides.
B: If a polygon has 9 sides, then it is a nonagon.
C: If a polygon is not a nonagon, then it does not have 9 sides.
D: If a polygon does not have 9 sides, then it is not a nonagon.

37. Which of the following is an equation of the line that passes through the point $(2, -3)$ and is parallel to the line $4x + 5y = 1$?

A: $-4x + 5y = -23$
B: $-5x - 4y = 2$
C: $-2x - 5y = 11$
D: $4x + 5y = -7$
E: $-5x + 4y = -22$

38. For what value of "x" are the lines m and p parallel?



A: x = 17
B: x = –9
C: x = 10
D: The lines are not parallel

39. Find the measure of one exterior angle of a regular 60-gon.

A: 60°
B: 10°
C: 6°
D: 360°
E: 184°

40. Which congruency theorem, if any, confirms that the following triangles are congruent?

A: SAS
B: SSS
C: ASA
D: Not congruent with given information
E: SSA