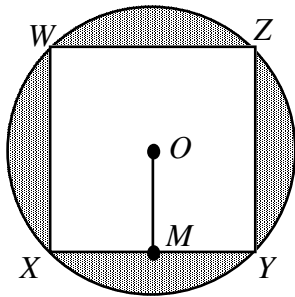


1. Find the surface area of a right circular cone whose slant height is 12 in. and whose base has a radius of 5 in.

- [A] $85\pi \text{ in.}^2$ [B] $65\pi \text{ in.}^2$ [C] $30\pi \text{ in.}^2$ [D] $70\pi \text{ in.}^2$

[1] _____

2. In the figure shown, square $WXYZ$ is inscribed in circle O . Also, $\overline{OM} \perp \overline{XY}$ and $OM = 3$. Find the area of the shaded region.



- [A] $18\pi - 36$ [B] $27\pi - 36$ [C] $9\pi - 9$ [D] $9\sqrt{2}\pi - 9$

[2] _____

3. Simplify: $(i - 4)(4i + 4)$ [A] $-20 - 12i$ [B] $-12 - 12i$ [C] $-12 + 12i$ [D] $-20 + 12i$

[3] _____

4. Solve: $\frac{1}{2} + \frac{1}{x+2} = \frac{2}{3}$ [A] 4 [B] 2 [C] 3 [D] 1

[4] _____

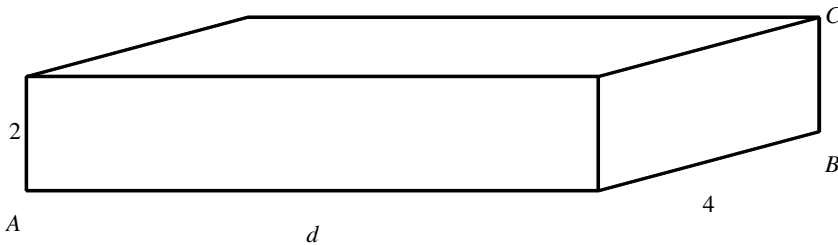
5. Determine whether the numbers represent the lengths of the sides of an acute triangle, a right triangle, an obtuse triangle, or no triangle.

22, 24, 47

- [A] no triangle [B] obtuse triangle [C] right triangle [D] acute triangle

[5] _____

6. Find the length of diagonal \overline{AC} in the rectangular solid shown. Dimensions are in feet.



[A] $20 + d^2$ ft.

[B] $6 + d$ ft.

[C] $\sqrt{20 + d^2}$ ft.

[D] $\sqrt{6 + d}$ ft.

[6] _____

7. Solve: $\sqrt{x+7} + \sqrt{x} = -3$

[A] $\frac{1}{9}$

[B] 4

[C] no solution [D] 1

[7] _____

8. Find the equation of the line that passes through the point $(-5, -6)$ and is parallel to the line $4x + y = -2$.

[A] $4x + y = -29$

[B] $-5x - 6y = -2$

[C] $4x + y = -26$

[D] $4x - y = -2$

[8] _____

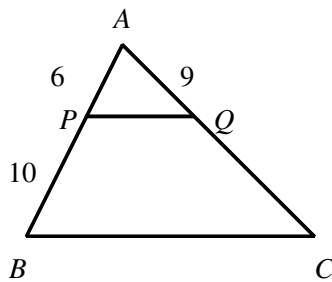
9. Given: $\overline{PQ} \parallel \overline{BC}$. Find the length of \overline{AC} .

[A] 21

[B] 26

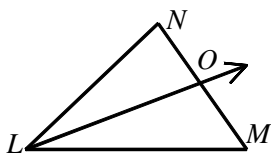
[C] 20

[D] 24



[9] _____

10. Find OM if \overrightarrow{LO} bisects $\angle NLM$, $LM = 18$, $NO = 5$, and $LN = 9$.



[A] 10

[B] 32.40

[C] 11.77

[D] 2.50

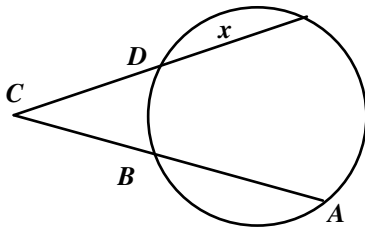
[10] _____

11. Simplify: $\frac{-2+i-3i^3}{-1+i}$ [A] $-3+i$ [B] $3+i$ [C] $-3-i$ [D] $3-i$
 [11] _____

12. Solve by the quadratic formula: $x^2 = 5x - 1$ [12] _____
 [A] $\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}$ [B] $\frac{-5 + \sqrt{21}}{2}, \frac{-5 + \sqrt{21}}{2}$
 [C] $5 + \sqrt{21}, 5 - \sqrt{21}$ [D] $-5 + \sqrt{21}, -5 + \sqrt{21}$

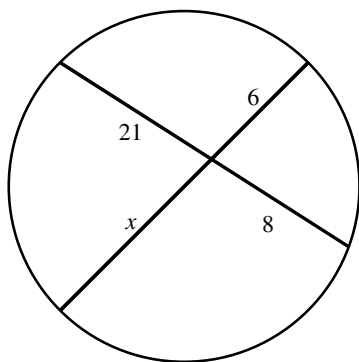
13. Find the sum of the measures of the interior angles of a hexagon.
 [A] 720° [B] 900° [C] 540° [D] 360°
 [13] _____

14. Find the value of x if $AB = 17$, $BC = 12$, and $CD = 13$. [A] 10.7 [B] 15.4 [C] 13.8 [D] 16.1



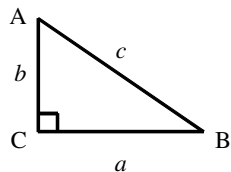
[14] _____

15. Solve for x . [A] 8 [B] 28 [C] 21 [D] 6



[15] _____

16. Given $\angle A = 54^\circ$ and $c = 18$, find b , to the nearest tenth.



- [A] 14.6 [B] 10.6 [C] 22.2 [D] 24.8

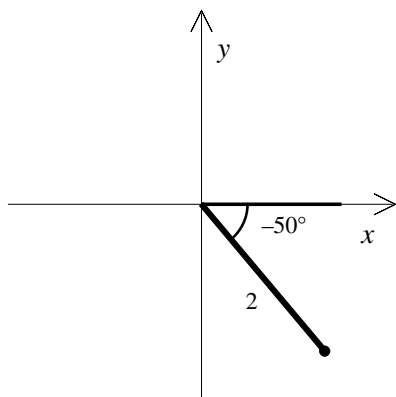
[16] _____

17. An airplane is flying at an altitude of 4700 ft above the ground. The pilot sights an object on the ground at an angle of depression of 30° . What is the slant range from the airplane to the object?

- [A] 9300 ft [B] 9900 ft [C] 9400 ft [D] 9350 ft

[17] _____

18. Describe the vector using polar notation.



- [A] $(2, 310^\circ)$ or $2 \angle 310^\circ$ [B] $(2, -130^\circ)$ or $-2 \angle -130^\circ$ [C] $(-2, 50^\circ)$ or $2 \angle 50^\circ$ [D] $(2, -50^\circ)$ or $2 \angle -50^\circ$

[18] _____

19. Convert $-2.7i + 3.6j$ to polar coordinates. (Write four forms for the point.)

[19] _____

- [A] $4.5 \angle 126.9^\circ$, $-4.5 \angle 306.9^\circ$, $4.5 \angle -306.9^\circ$, $-4.5 \angle -126.9^\circ$
 [B] $4.5 \angle 53.1^\circ$, $-4.5 \angle 233.1^\circ$, $4.5 \angle -306.9^\circ$, $-4.5 \angle -126.9^\circ$
 [C] $4.5 \angle 126.9^\circ$, $-4.5 \angle 306.9^\circ$, $4.5 \angle -233.1^\circ$, $-4.5 \angle -53.1^\circ$
 [D] $4.5 \angle 53.1^\circ$, $-4.5 \angle 233.1^\circ$, $4.5 \angle -233.1^\circ$, $-4.5 \angle -53.1^\circ$

20. Simplify: $\frac{\frac{4}{x} + \frac{3}{3x}}{\frac{1}{3x} - \frac{3}{2x}}$

- [A] $-\frac{7}{30}$ [B] $-\frac{30}{7}$ [C] $\frac{7}{12x^2}$ [D] $\frac{1}{12x^2}$

[20] _____

21. Solve for t : $y = w\left(\frac{sv}{t} + \frac{x}{u}\right)$

[A] $t = \frac{suwv}{uy - xw}$

[B] $t = \frac{uy + xw}{suwv}$

[C] $t = \frac{xwu}{uy - svw}$

[D] $t = \frac{xwu}{uy + svw}$

[21] _____

22. How many gallons of a 70% salt solution must be mixed with 30 gallons of a 21% solution to obtain a solution that is 60% salt?

[A] 11.7 gallons

[B] 6.3 gallons

[C] 117 gallons

[D] 63 gallons

[22] _____

23. Solve: $\begin{cases} x^2 + y^2 = 16 \\ x + y = 4 \end{cases}$

[A] $\{(0, 0), (4, -4)\}$

[B] $\{(4, -4), (-4, -4)\}$

[C] $\{(0, -4), (-4, 0)\}$

[D] $\{(0, 4), (4, 0)\}$

[23] _____

24. Simplify by factoring the numerator: $\frac{x^{10f} - y^{10f}}{x^{5f} + y^{5f}}$

[A] $x^{5f} + y^{5f}$

[B] $x^{2f} + y^{2f}$

[C] $x^{2f} - y^{2f}$

[D] $x^{5f} - y^{5f}$

[24] _____

25. Find $f(3)$ given $f(x) = x^2 - 4x - 6$.

[A] -9

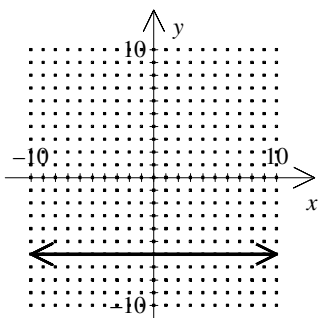
[B] -15

[C] -3

[D] -33

[25] _____

26. Determine whether the graph represents a function. If so, determine whether the graph is a one-to-one function or not.



[A] not a function

[B] a function, one-to-one

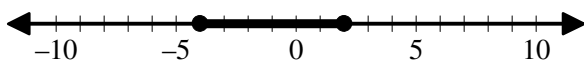
[C] a function, not one-to-one

[D] none of these

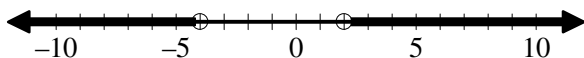
[26] _____

27. Graph the following set on the real number line. $\{x \in \mathbf{R} \mid |x+1| \geq 3\}$ [27] _____

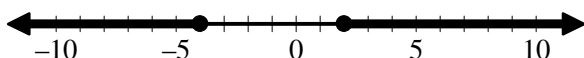
[A]



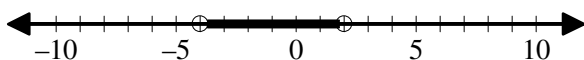
[B]



[C]



[D]



28. Given $f(x) = \frac{x+2}{x}$ and $g(x) = x^2 - 6$, find $(g \circ f)(7)$.

[A] $-\frac{33}{7}$

[B] $-\frac{213}{49}$

[C] $-\frac{437}{81}$

[D] $\frac{45}{43}$

[28] _____

29. One machine can make 30 levers in 5 minutes. Another machine can make 56 levers in 8 minutes. The second machine began making levers 4 minutes before the first began. How long will it take the two machines together to finish making 249 levers?

[A] 17 min.

[B] 18 min.

[C] 15 min.

[D] 20 min.

[29] _____

30. Write the equation $9^{3/2} = 27$ in logarithmic form.

[A] $2\log_3 27 = 9$

[B] $\log_9 27 = \frac{3}{2}$

[C] $\log_{27} 9 = \frac{2}{3}$

[D] $\log_{3/2} 27 = 9$

[30] _____

31. Solve: $\log_5 x = 2$

[A] 32

[B] 1

[C] $\sqrt{5}$

[D] 25

[31] _____

32. Evaluate: $4 \sin 240^\circ$ [A] $\frac{3\sqrt{3}}{2}$ [B] $-\sqrt{2}$ [C] $-2\sqrt{3}$ [D] 1
 [32] _____

33. Evaluate $\frac{12!}{5!7!}$. Do not use a calculator. [A] 792 [B] 836 [C] 770 [D] 10,024
 [33] _____

34. Evaluate $\cos 300^\circ + \cos 180^\circ - \cos 240^\circ + \cos 270^\circ$. Do not use a calculator.
 [A] 1 [B] 0 [C] $-\frac{3}{2}$ [D] $\frac{1}{2}$
 [34] _____

35. Find the resultant of $3 \angle 30^\circ + 6 \angle 18^\circ$. Write the answer in polar coordinates.
 [A] $8.00 \angle 48.00^\circ$ [B] $8.96 \angle 21.96^\circ$ [C] $8.96 \angle 68.04^\circ$ [D] $9.00 \angle 48.00^\circ$
 [35] _____