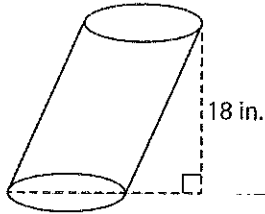


Midterm Review Integrated 3 Multiple Choice 2016-2017

1. The oblique cylinder shown below has a volume of 90π cubic inches. What is the radius of the base of the cylinder?



$$V_{\text{cyl}} = \pi r^2 h$$

$$\frac{90\pi}{18\pi} = \frac{\pi (18)r^2}{18\pi}$$

$$5 = r^2$$

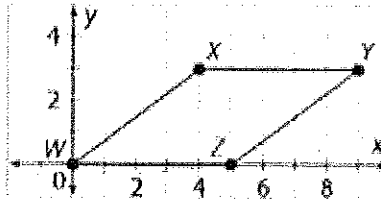
$$r = \sqrt{5} \text{ in}$$

2. Name all properties of a parallelograms?

Opposite sides parallel
 Opposite sides congruent
 Opposite angles are congruent
 Diagonals bisect each other

Consecutive angles supplementary

3. Classify Quadrilateral WXYZ.



$$W(0,0)$$

$$X(4,3)$$

$$Y(9,3)$$

$$Z(5,0)$$

$$WX = 5$$

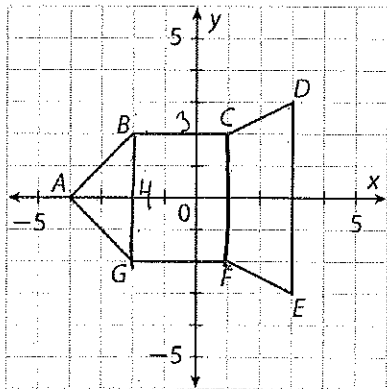
$$WZ = 5$$

$$WX = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$$

$$WZ = \sqrt{5^2 + 0^2} = \sqrt{25} = 5$$

- a. Parallelogram
 b. Trapezoid
 c. Rectangle
 d. Rhombus

Use the figure for 4. The figure is symmetric about the x-axis.



$$BCFG = 3(4) = 12$$

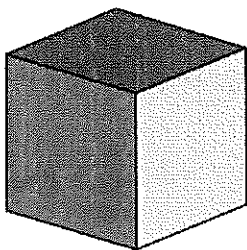
$$CFED = \frac{1}{2}(4+6)(2) = 10$$

$$ABG = \frac{1}{2}(2)(4) = 4$$

4. What is the area of the figure?

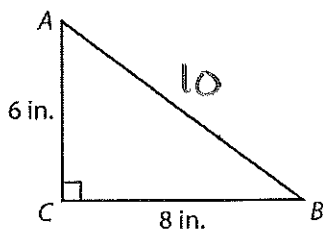
$$A = 12 + 10 + 4 = 26 \text{ units}^2$$

5. In the figure shown, what figure is a possible cross section of the cube?

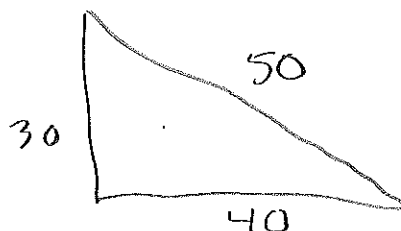


square

Use the triangle shown for 6.



$$\begin{aligned} 6^2 + 8^2 &= c^2 \\ 36 + 64 &= c^2 \\ 100 &= c^2 \\ 10 &= c \end{aligned}$$



6. The dimensions of the triangle are increased by a scale factor of 5. What is the perimeter of the resulting triangle?

$$\begin{aligned} p &= 30 + 40 + 50 \\ &= 120 \text{ in} \end{aligned}$$

7. A rectangular closet is being designed so that it will have a capacity of at least 72 cubic feet. The height of the closet must be 5 feet and the width 2 feet. What must be the length of the closet? Round your answer to the nearest tenth of a foot.

$$\begin{aligned} V_{\text{prism}} &= l \times w \times h \\ 72 &= 5 \times 2 \times l \\ 72 &= 10l \\ \boxed{7.2 \text{ ft}} \end{aligned}$$

8. What is a possible root for the polynomial $x^3 + 5x^2 - 4 = 0$.

$$\boxed{-1}$$

$$\begin{array}{r|rrrr} -1 & 1 & 5 & 0 & -4 \\ & & -1 & -4 & 4 \\ \hline & 1 & 4 & -4 & 0 \end{array}$$

$$x^2 + 4x - 4$$

9. Solve the equation $((4x-6)^{\frac{1}{2}})^2 - (2x-3)^2$

$$4x-6 = 4x^2 - 6x - 6x + 9$$

$$0 = 4x^2 - 16x + 15$$

$$0 = (2x-3)(2x-5)$$

$$x = \frac{3}{2}, \frac{5}{2}$$

10. What are the roots of the function $f(x) = x^4 + 11x^2 + 18$?

$$0 = (x^2 + 9)(x^2 + 2)$$

$$x^2 + 9 = 0$$

$$x^2 = -9$$

$$x = \pm 3i$$

$$x^2 + 2 = 0$$

$$x^2 = -2$$

$$x = \pm i\sqrt{2}$$

11. Simplify $(2x^4 - 2x^3 - x^2) + (3x^4 + x^2 + x)$.

$$5x^4 - 2x^3 + x$$

12. Factor $3x^2 - 2x - 8$

$$(3x+4)(x-2)$$

13. Find product of $(2x+3y)(x+y)^2$

$$(2x+3y)(x+y)(x+y)$$

$$(2x+3y)(x^2 + 2xy + y^2)$$

$$2x^3 + 4x^2y + 2xy^2 + 3x^2y + 6xy^2 + 3y^3$$

$$2x^3 + 7x^2y + 8xy^2 + 3y^3$$

14. Find the inverse of $g(x) = -3x - 5$.

$$y = -3x - 5$$

$$y + 5 = -3x$$

$$-\frac{1}{3}y - \frac{5}{3} = x$$

$$y = -\frac{1}{3}x - \frac{5}{3}$$

$$g^{-1}(x) = -\frac{1}{3}x - \frac{5}{3}$$

15. Describe how the graph of $g(x) = (6x)^3 + 6$ is related to the graph of $f(x) = x^3$.

horizontal compression by $\frac{1}{6}$

vertical shift up 6

