

Volume

1. A water bottle has the shape of a cylinder that is 22 cm high with a 5-cm radius. The bottle is exactly half-filled with water. What is the volume of the water in the bottle, rounded to the nearest tenth?

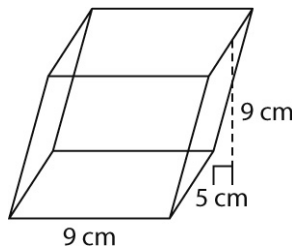
- A 172.8 cm³
- B 345.6 cm³
- C 863.9 cm³
- D 1900.7 cm³

2. A triangular prism has a base with area 24 cm². The height of the prism is 9 cm. What is the volume of the prism?

3. A sphere has a volume of $\frac{32}{3}\pi$ cubic units. What is the radius of the sphere?

- A 1 unit
- B 2 units
- C 4 units
- D 8 units

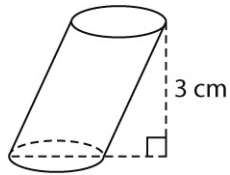
4. What is its volume of the oblique prism shown below?



5. What is the volume of a right cone that has a diameter of 12 cm and a height of 18 cm? Round to the nearest tenth.

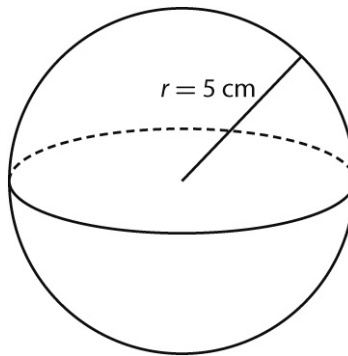
Volume

6. The oblique cylinder shown below has a volume of 3π cubic meters.



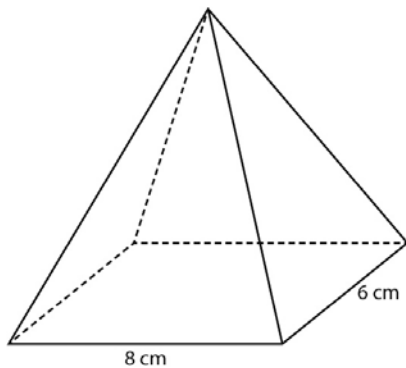
What is the radius of the base of the cylinder?

7. Look at the sphere below.



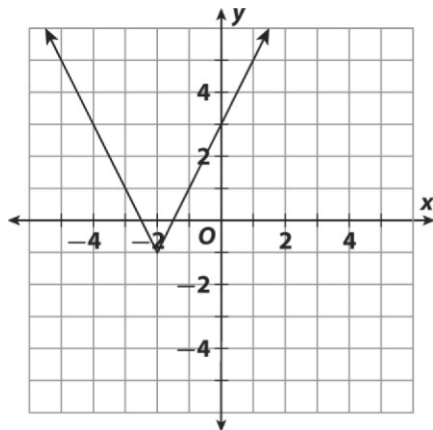
What is the volume of the sphere to the nearest whole number?

8. If the height of the pyramid is 10 cm, what is the volume of the pyramid?



Absolute Value Functions, Equations, and Inequalities

Use the graph below for 1–4.



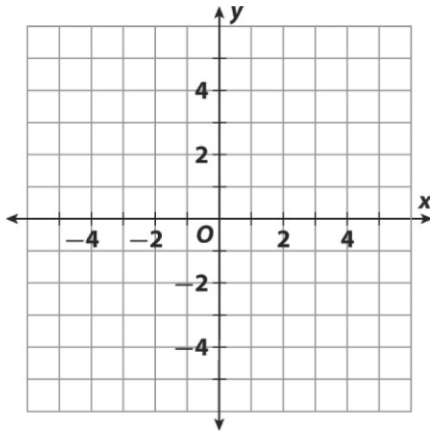
1. Write a function in standard form to match the graph. Let $b = 1$.
2. Find the vertex of the function.
3. Find the domain of the function.
4. Find the range of the function.
5. Given that $f(x) = |x| - 3$, determine if each statement is True or False.
 - A The domain is all real numbers.
True False
 - B The vertex is $(0, -3)$.
True False
 - C The vertex is $(0, 3)$.
True False
 - D The range is all real numbers.
True False
6. If $g(x) = |x + 7|$, write a function $h(x)$ that is $g(x)$ translated down 2 units.

Absolute Value Functions, Equations, and Inequalities

7. Is each value of x a solution of $8 \leq |6 - 2x| - 12$?

A -9	Yes	No
B -6	Yes	No
C 10	Yes	No
D 13	Yes	No

8. Graph $y = -\frac{1}{2}|x-1| + 3$.



9. A company ordered 5-foot long steel rods. The length of the rods that the company received vary from a maximum length of 0.05 inches longer than 5 feet to a minimum length of 0.05 inches shorter than 5 feet. Write and solve an absolute value inequality to represent the possible length of each rod in inches.

Polynomial Operations

1. Evaluate the expression $\frac{20^{\frac{1}{5}}}{\left(\frac{5}{8}\right)^{\frac{1}{5}}}$.

2. Simplify the expression $\frac{\sqrt[3]{40x^5y^{11}z^6}}{\sqrt[3]{5x^{-3}y^7z^{-3}}}$.

3. Which best describes $7x^2yz + 8xy - 18$?

- A cubic binomial
- B cubic trinomial
- C quadratic trinomial
- D quartic trinomial

4. What is the sum of $(1.2x^5 - 5x^3 - 0.7) + (3.7x^5 + 3)$?

5. What is the product of $13x^3yz^2$ and $6x^3y^2z$?

6. Multiply $(3x - 2)(2x + 6)$. What is the product?

7. Multiply $(2x + 1)(3x^2 + 5x - 1)$. What is the product?

Polynomial Operations

8. Choose True or False for each statement about the polynomial $3x^2y^2 + 5xy - 8$.

- | | | | |
|---|--------------------------------|------|-------|
| A | The degree is 3. | True | False |
| B | The polynomial is a trinomial. | True | False |
| C | -8 is a coefficient. | True | False |
| D | 5 is a constant term. | True | False |

9. Simplify $9m^2n - 9m^2 + 7n - 14m^2n - m^2$.

10. Subtract $\left(\frac{21}{2}x^2 + 9\right) - \left(\frac{1}{2}x^2 - 5x - 2\right)$.

11. Multiply $(5t^2 - 13t)(t + 5)$.

12. Multiply $(x - 4)^3$.

13. Multiply $(2x + 1)(x^3 - 1)$.

14. What is the degree of the polynomial $6x^3y^2 + 7xy^4z - 4x^2y + 5$

Trigonometric Functions

For 1–3, change degrees to radians.

1. $36^\circ =$ _____ radians

2. $240^\circ =$ _____ radians

3. $72^\circ =$ _____ radians

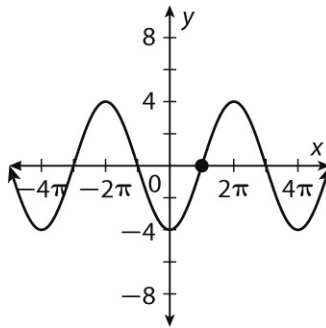
4. Which trigonometric function has the same value as $\sin \frac{14\pi}{3}$?

A $\sin \frac{2\pi}{3}$

B $\sin \frac{4\pi}{3}$

C $\sin \frac{5\pi}{3}$

For 5–6, use the graph.



5. What is the horizontal expansion factor?

A 2

B 4

C 8

6. What is the amplitude?

A 2

B 4

C 8

For 7–9, change radians to degrees.

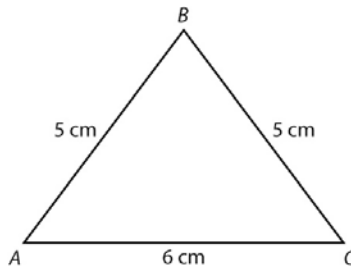
7. $\frac{4\pi}{9} =$ _____ degrees

8. $\frac{11\pi}{18} =$ _____ degrees

9. $\frac{3\pi}{5} =$ _____ degrees

Trigonometric Functions

10. Look at the triangle below.



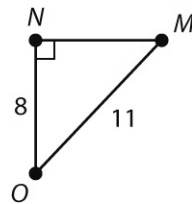
What is $m\angle A$, to the nearest hundredth of a degree?

A 53.13°

B 60.00°

C 73.74°

11. Which expression gives $m\angle M$?

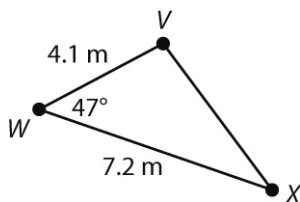


A $\sin^{-1}\left(\frac{8}{11}\right)$

B $\cos^{-1}\left(\frac{8}{11}\right)$

C $\tan^{-1}\left(\frac{8}{11}\right)$

12. What is the area of $\triangle VWX$, to the nearest tenth?



13. What is $m\angle A$, to the nearest degree?

