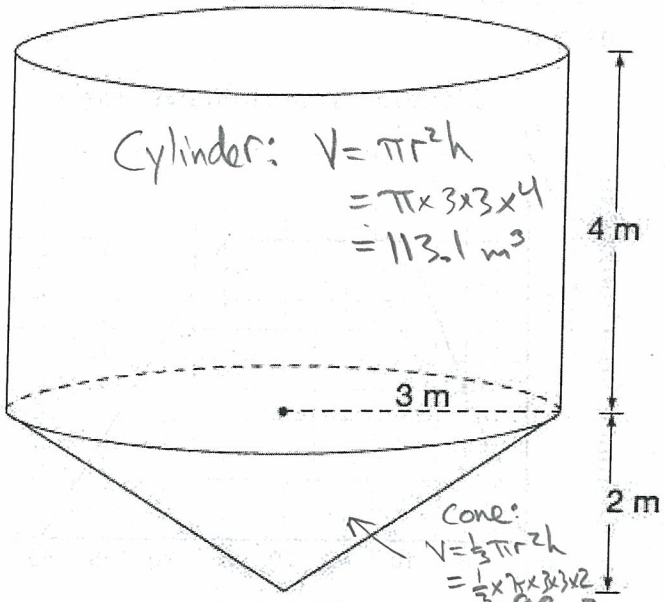
# GRADE 9 APPLIED MATH

## UNIT 4

## PRACTICE TEST QUESTIONS


# SOLUTIONS

1) A container that stores grain is in the shape of a cylinder and cone as shown below.




Which is closest to the volume of the container?

a 88 m³

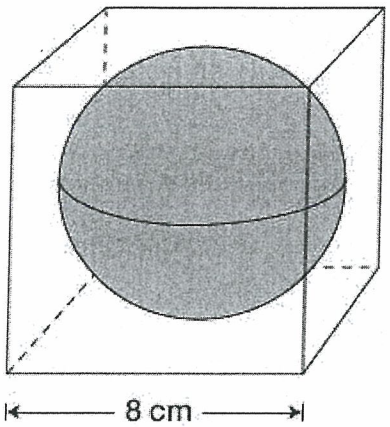
b 113 m³

c 132 m³

d 170 m³

113.1 + 18.8
= 131.9 m³

3) The diagram below shows a spherical globe in a cube-shaped box. The globe fits tightly in the box.




Box:
V = lwh
= 8 × 8 × 8
= 512 cm³

Globe:
V = ⅘πr³
= ⅘ × π × 4 × 4 × 4
≈ 268.1 cm³

Which is closest to the volume of empty space in the box?

a 244 cm³

b 268 cm³

c 512 cm³

d 780 cm³

Space:
512 − 268.1
= 243.9 cm³

2) For which of the following is $x = -7$ **not** a solution?

a $4 = x + 11$

b $3x = x - 28$

c $5 = -2x - 9$

d $5x = 2x - 21$

Left Side: $3x = 3(-7) = -21$

Right Side: $x - 28 = -7 - 28 = -35$

↖ Not equal ↗

4) What value of $x$ makes the equation $4x - 5 = -6x + 15$ true?

a 2

b 1

c −5

d −10

$4x - 5 = -6x + 15$

$+6x \quad +6x$

$10x - 5 = 15$

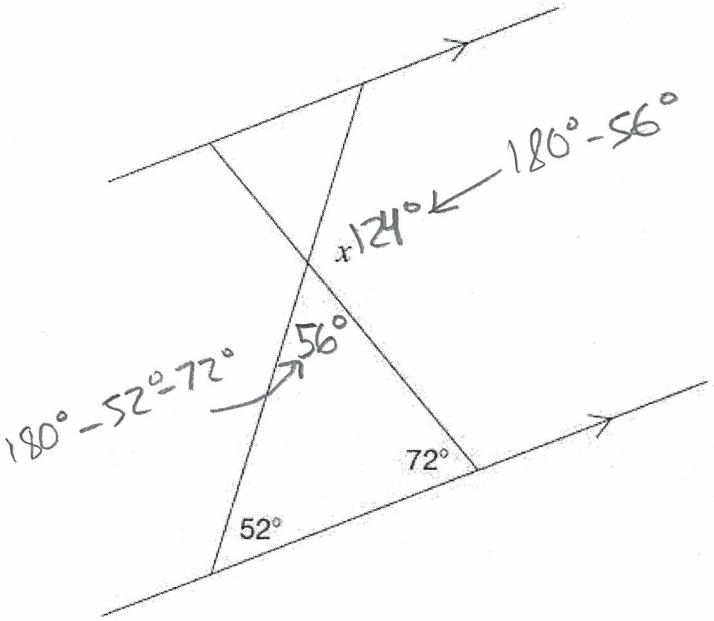
$+5 \quad +5$

$10x = 20$

$\frac{10x}{10} = \frac{20}{10}$

$x = 2$

5) What is the value of $x$ in the diagram below?




a 56°

b 72°

c 108°

d 124°

6) Tennis balls have a radius of 3.5 cm.

Which of the following is closest to the volume of 2 tennis balls?

a 88 cm$^3$

b 180 cm$^3$

c 359 cm$^3$

d 1078 cm$^3$

$V = \frac{4}{3}\pi r^3$

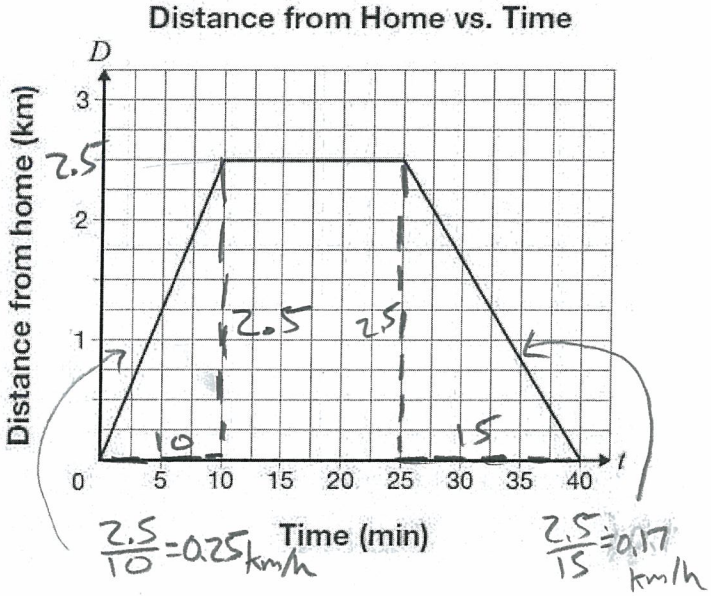
$= \frac{4}{3} \times \pi \times 3.5 \times 3.5 \times 3.5$

$= 179.6 \text{ cm}^3$

$179.6 \times 2 = 359.2 \text{ cm}^3$

7) Oscar rides his bicycle to the beach along a straight road. While at the beach, he realizes he has forgotten his sunscreen and returns home.

The graph below shows information about his trip.




Which of the following is true about Oscar's trip?

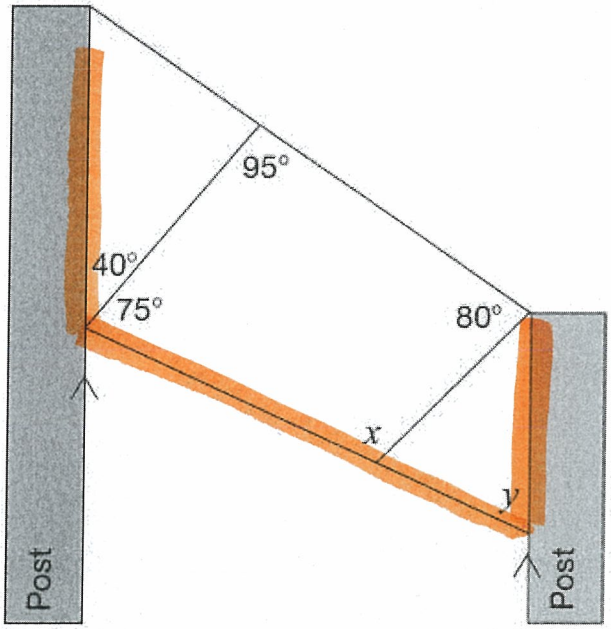
a The beach is 10 km from Oscar's home.

b His speed riding to the beach is 0.25 km/min.

c His speed riding home from the beach is 1.7 km/min.

d He stays at the beach for 25 minutes before he returns home to get sunscreen.

8) A sign is strung between two posts as shown below.

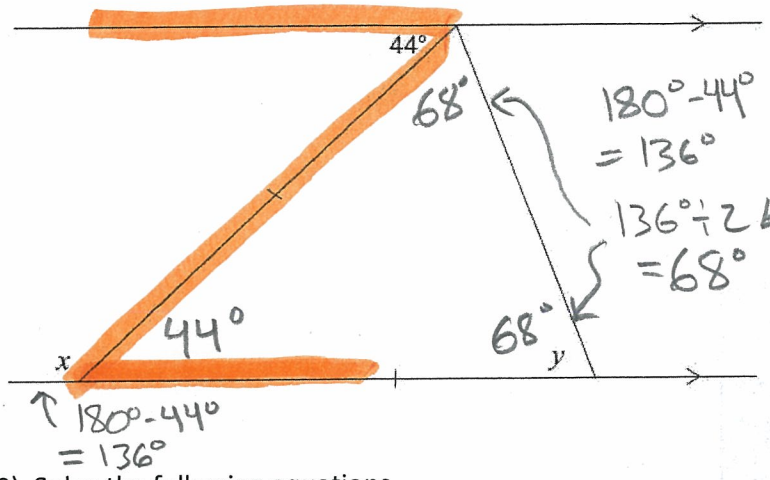



Complete the table below with the values of $x$ and $y$.

Justify your answers using geometric properties.

| Value | Justification using geometric properties |
|---|---|
| $x =$ 110° | Angles in a quadrilateral add up to 360°<br>360° - 75° - 95° - 80° = 110° |
| $y =$ 65° | Interior angles from parallel lines add up to 180° (C-pattern)<br>180° - 75° - 40° = 65° |

9) Determine the values of angles *x* and *y* in the following diagram.




180°-44° = 136°

136°÷2 = 68°

↑ 180°-44° = 136°

Isosceles triangle (2 equal angles)

$x =$ 136°

$y =$ 68°

10) Solve the following equations.

a) $5x - 3x + 6 = 5 + 17$

$2x + 6 = 22$ (−6 −6)

$2x = 16$

$\frac{2x}{2} = \frac{16}{2}$

$x = 8$

b) $2x + 3 - 5x + 1 = -10 - 4$

$2x - 5x + 3 + 1 = -10 - 4$

$-3x + 4 = -14$ (−4 −4)

$-3x = -18$

$\frac{-3x}{-3} = \frac{-18}{-3}$

$x = 6$

c) $6x - 3 = 2x + 9$ (−2x −2x)

$4x - 3 = 9$ (+3 +3)

$4x = 12$

$\frac{4x}{4} = \frac{12}{4}$

$x = 3$

d) $-7x + 4 + x = 4 - 5x + 10$

$-7x + x + 4 = -5x + 4 + 10$

$-6x + 4 = -5x + 14$ (+5x +5x)

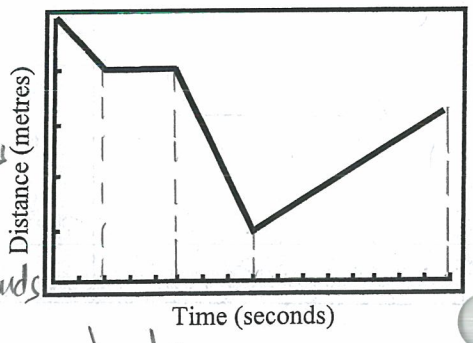
$-1x + 4 = 14$ (−4 −4)

$-1x = 10$

$\frac{-1x}{-1} = \frac{10}{-1}$

$x = -10$

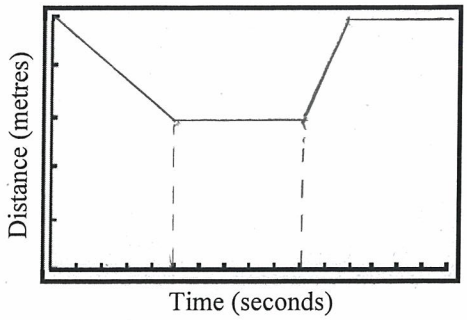
11) The graph on the right shows Paul's distance from a motion sensor. Describe Paul's walk. **Use distances and times** in your explanation.




- Paul starts 5m from the sensor
- He walks 1m toward the sensor in 2 seconds
- He stops for 3 seconds
- He runs toward the sensor for 3 seconds
- When he is 1m from the sensor, he starts walking away from the sensor (2m in 8 seconds)

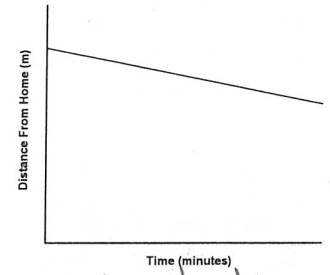
12) A story is described below. Sketch the graph that describes the story in the diagram provided.

Begin 5 m from the wall.
**Walk** toward the wall for 5 seconds.
Stop for 5 seconds.
**Run** back to your starting position.
Stop.

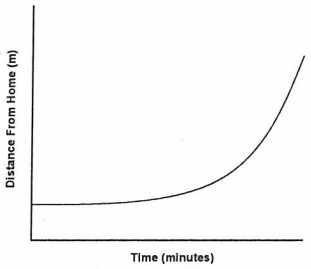



13) Under each of the following graphs, **choose the phrase** that best describes what the graph shows.

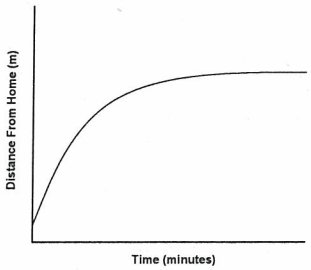
| **Phrase Choices:** | "slowing down" | "speeding up" |
|---|---|---|
| | "moving slowly towards" | "moving quickly towards" |
| | "moving slowly away" | "moving quickly away" |



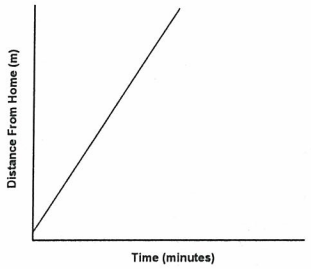

moving slowly towards




Speeding up

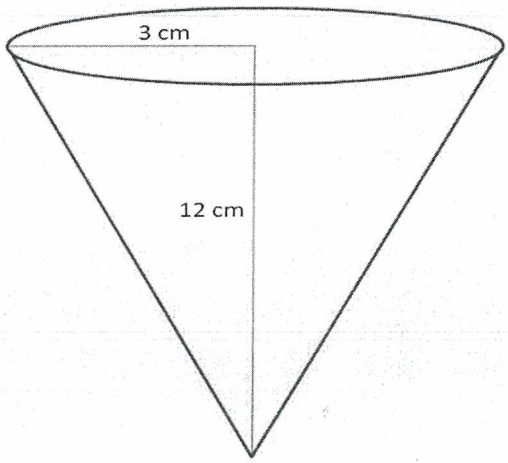



slowing down




moving quickly away

14) Frozen ice cream treats are sold in cone-shaped containers. The containers are 12 cm high and have a 3 cm radius at the base. Find the volume of ice cream that fits inside the cone.




$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 3 \times 3 \times 12$

$\doteq 113.1 cm^3$

15) A spherical snowball has a **diameter of 7 cm**. **Determine the volume** of the snowball.

* radius = 3.5 cm

$V = \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times 3.5 \times 3.5 \times 3.5$

$\doteq 179.6 cm^3$