

Cumulative Assessment Unit 1: Measurement (Chapter 1&2)

NAME Me

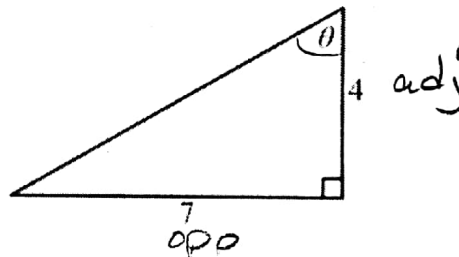
Select the correct answer for each of the following. Mark your answers on the Scantron form.

1. Which of the following examples is the best referent for one millimeter?

- a. Diameter of a penny
- b. Thickness of a fingernail
- c. Length of a five-dollar bill
- d. Distance from the floor to a door knob

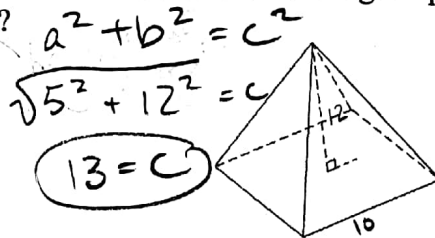
2. Which trigonometric expression could be used to determine the measure of angle  $\theta$ ?

- ~~a.  $\sin^{-1}\left(\frac{4}{7}\right)$~~
- b.  $\tan^{-1}\left(\frac{4}{7}\right)$
- ~~c.  $\cos^{-1}\left(\frac{4}{7}\right)$~~
- d.  $\tan^{-1}\left(\frac{7}{4}\right)$



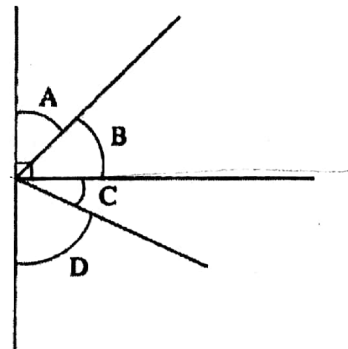
3. Which expression could be used to calculate the surface area of the right square-based pyramid with a base length of 10 cm and a height of 12 cm?

- a.  $SA = 2(10)(12) + (10)^2$
- b.  $SA = 2(10)(12) + (12)^2$
- c.  $SA = 2(10)(13) + (10)^2$
- d.  $SA = 2(10)(13) + (13)^2$



4. Which of the following angles is an angle of depression?

- a. A
- b. B
- c. C
- d. D

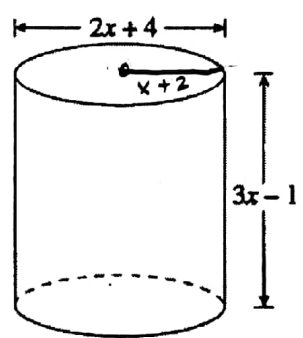


5. Which of the following calculations converts 4 yards into centimetres?

- a.  ~~$4 \text{ yd} \times \frac{2.54 \text{ cm}}{1 \text{ in}}$~~
- b.  ~~$4 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{2.54 \text{ cm}}{1 \text{ ft}}$~~
- c.  $4 \text{ yd} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}}$
- d.  ~~$4 \text{ yd} \times \frac{1 \text{ ft}}{3 \text{ yd}} \times \frac{1 \text{ in}}{12 \text{ ft}} \times \frac{1 \text{ cm}}{2.54 \text{ in}}$~~

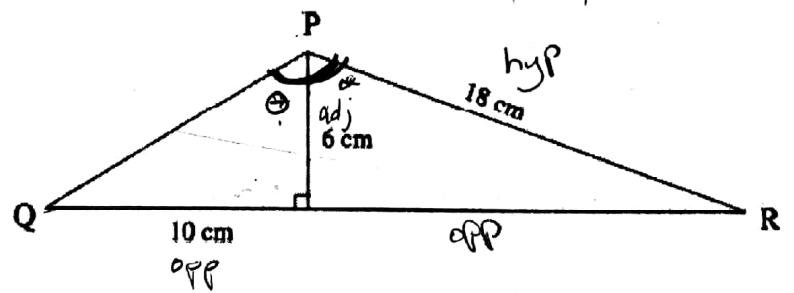
6. Which of the following expressions represents the volume of the cylinder below?

- a.  $V = \pi (6x^2 + 10x - 4)$
- b.  $V = \pi (3x^3 - x^2 + 12x - 4)$
- c.  $V = \pi (3x^3 + 11x^2 + 8x - 4)$
- d.  $V = \pi (12x^3 + 32x - 16)$



$$\begin{aligned}
 V &= \pi r^2 h \\
 &= \pi (x+2)^2 (3x-1) \\
 &= \pi (x^2 + 4x + 4)(3x-1) \\
 &= \pi (3x^3 - x^2 + 12x^2 - 4x + 12x - 4) \\
 &= \pi (3x^3 + 11x^2 + 8x - 4)
 \end{aligned}$$

7. Determine the measure of  $\angle QPR$ .



- a.  $59^\circ$
- b.  $71^\circ$
- c.  $102^\circ$
- d.  $130^\circ$

$$\begin{aligned}
 \tan \theta &= \frac{\text{opp}}{\text{adj}} \\
 \theta &= \tan^{-1}\left(\frac{10}{6}\right) \\
 \theta &= 59.0362^\circ
 \end{aligned}$$

$$\begin{aligned}
 \cos \alpha &= \frac{\text{adj}}{\text{hyp}} \\
 \alpha &= \cos^{-1}\left(\frac{6}{18}\right) \\
 \alpha &= 70.5288^\circ
 \end{aligned}$$

$$\begin{aligned}
 \angle QPR &= \\
 &= 59.0362^\circ + 70.5288^\circ \\
 &= 129.565^\circ
 \end{aligned}$$

8. Calculate the volume of the right cone below.

$$\sin 20^\circ = \frac{\text{opp}}{25}$$

$$25 \sin 20^\circ = 8.5505 \text{ cm}$$

$$\text{height} \cos 20^\circ = \frac{\text{adj}}{25}$$

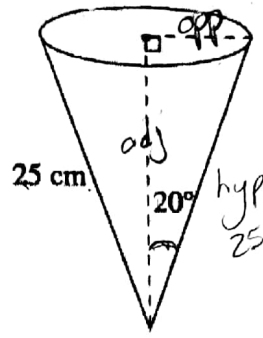
$$25 \cos 20^\circ = 23.4923 \text{ cm}$$

a. 210 cm<sup>3</sup>

**b. 1799 cm<sup>3</sup>**

c. 1914 cm<sup>3</sup>

d. 2168 cm<sup>3</sup>



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

$$V = \frac{1}{3} \pi (8.5505)^2 (23.4923)$$

$$V = 1798.6107 \text{ cm}^3$$

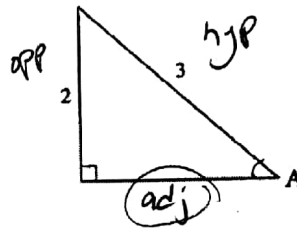
9. Determine the ratio of cos A.

a.  $\cos A = \frac{2}{3}$

**b.  $\cos A = \frac{\sqrt{5}}{3}$**

c.  $\cos A = \frac{\sqrt{13}}{3}$

d.  $\cos A = \frac{3}{\sqrt{5}}$



$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$a^2 + b^2 = c^2$$

$$\sqrt{3^2 - 2^2} = c$$

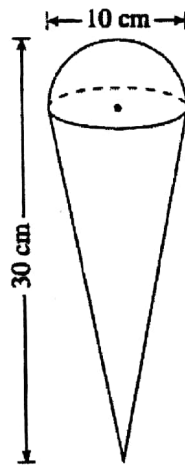
$$\sqrt{5} = c$$

10. Determine the surface area of the solid below.

$$SA = \pi r s + 2\pi r^2$$

$$= \pi (5)(25.4951) + 2\pi (25)$$

$$= 557.5557$$



$$s^2 = a^2 + b^2$$

$$s = \sqrt{5^2 + 25^2}$$

$$s = 25.4951$$

a. 481 cm<sup>2</sup>

**b. 558 cm<sup>2</sup>**

c. 1414 cm<sup>2</sup>

d. 2199 cm<sup>2</sup>

11. A cat on the ground is 50 m away from the base of a pole. An osprey's nest is on the top of the pole, which is 20 m tall. What is the measure of the angle of inclination from the cat to the osprey's nest?

a. 22°

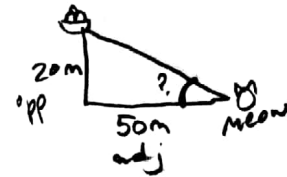
b. 24°

c. 66°

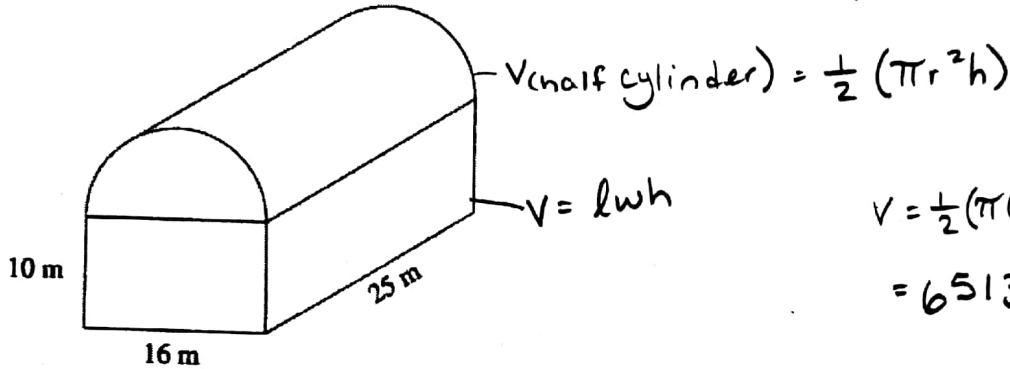
d. 68°

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\theta = \tan^{-1}\left(\frac{20}{50}\right)$$



12. Calculate the volume of the shape below:



$$V = \frac{1}{2}(\pi(8)^2(25)) + (10)(16)(25)$$

$$= 6513.2741$$

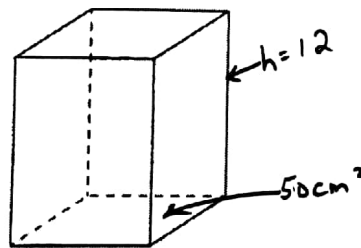
a. 6513 m<sup>3</sup>

b. 9027 m<sup>3</sup>

c. 14 053 m<sup>3</sup>

d. 24 106 m<sup>3</sup>

13. A wooden block is a square-based prism, as shown below:



$$\text{edge of base} = \sqrt{50}$$

$$\text{Top + Bottom} = 50 + 50 = 100 \text{ cm}^2$$

$$4 \text{ equal rectangles} = 4(\sqrt{50} \cdot 12) = 339.4113$$

$$339.4113 + 100$$

Given the base area is 50 cm<sup>2</sup> and the height is 12 cm, what is its surface area?

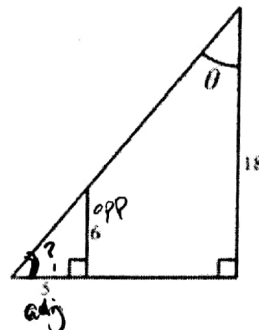
a. 339 cm<sup>2</sup>

b. 439 cm<sup>2</sup>

c. 600 cm<sup>2</sup>

d. 1300 cm<sup>2</sup>

14. Determine the value of  $\theta$ .



$$\tan ? = \frac{6}{5}$$

$$? = \tan^{-1}\left(\frac{6}{5}\right)$$

$$? = 50.1944$$

$$180^\circ - 90^\circ - 50.1944^\circ$$

=

a. 39.8°

b. 56.4°

c. 50.2°

d. 33.6°

15. Which of the following measurements is the longest: 120 cm, 40 inches, 1 metre, or 1 yard?

a. 120 cm

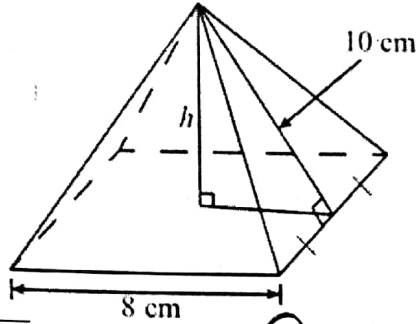
b. 40 inches

c. 1 metre

d. 1 yard

1.2 m  
 $40 \text{ in} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 101.6 \text{ cm}$   
 $= 0.9144 \text{ m}$

16. Which equation below can be used to find the height of the right square pyramid shown?



$10^2 - 4^2 = h^2$   
 $h = \sqrt{10^2 - 4^2}$

a.  $h = \sqrt{10^2 - 8^2}$

b.  $h = \sqrt{10^2 - 4^2}$

c.  $h = \sqrt{10^2 + 8^2}$

d.  $h = \sqrt{10^2 + 4^2}$

17. Which of the following is the best estimate of the height of a standard motorcycle?

a. 25 cm

b. 1 m

c. 1 ft

d. 0.5 km

18. Alanna is pulled over for driving 60 mph in a 60 km/h zone. How fast was she driving in km/h?

a. 90 km/h

b. 96.5 km/h

c. 100 km/h

d. 103.5 km/h

$60 \text{ mi} \cdot \frac{1.609 \text{ km}}{\text{mi}} = 96.54 \text{ km/h}$

19. A cylinder has a surface area of 402 cm<sup>2</sup>. The height is three times greater than the radius. What is the height of the cylinder?

$402 = 2\pi r^2 + 2\pi r(3r)$   
 $402 = 2\pi r^2 + 6\pi r^2$   
 $402 = 8\pi r^2 \rightarrow r = \sqrt{\frac{402}{8\pi}}$

a. 8.00 cm

b. 10.48 cm

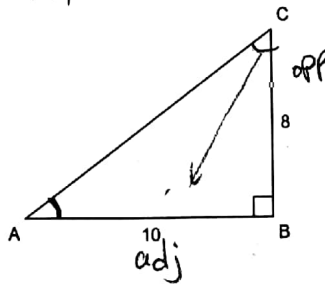
c. 12.00 cm

d. 16.97 cm

$h = 3 \cdot r \rightarrow h = 3(3.9994)$

$r = 3.9994 \text{ cm}$

20. Determine tan A and tan C.



$\tan A = \frac{8}{10} = 0.8$

$\tan C = \frac{10}{8} = 1.25$

a. tan A = 1.25; tan C = 0.8

b. tan A = 0.8; tan C = 1.25

c. tan A = 0.6247...; tan C = 1.25

d. tan A = 0.8; tan C = 0.7809...

$$C = 2\pi r \quad r = \frac{264}{(2\pi)}$$

$$r = 42.0169$$

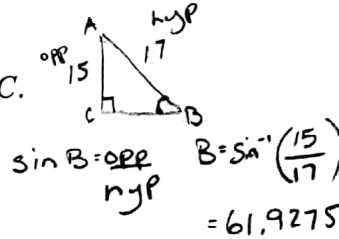
21. A bowling ball measures 264 cm in circumference. What is the volume of the smallest cube that will hold this ball?

$$V = \frac{4}{3}\pi(42.0169)^3 = 310713.8631 \text{ cm}^3$$

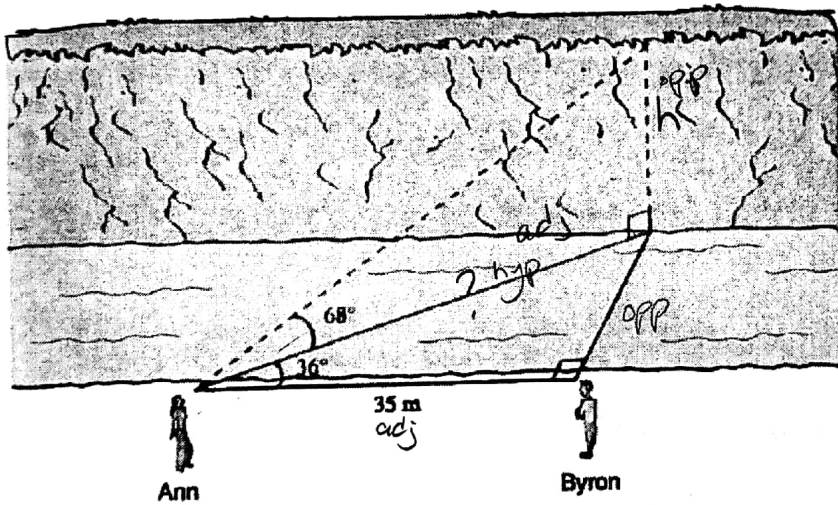
- a. Approximately 75 000 cm<sup>3</sup>
- b. Approximately 311 000 cm<sup>3</sup>
- c. Approximately 594 000 cm<sup>3</sup>
- d. Approximately 2 300 000 cm<sup>3</sup>

22. In  $\triangle ABC$ ,  $\angle C = 90^\circ$ ,  $AB = 17$  cm and  $AC = 15$  cm. Calculate the measure of  $\angle ABC$ .

- a. 28°
- b. 41°
- c. 49°
- d. 62°



23. Ann and Byron positioned themselves 35 m apart on one side of a stream. Ann measured the angles, as shown below.



①  $\cos 36^\circ = \frac{35}{\text{hyp}}$   
 $\text{hyp} \cos 36^\circ = 35$   
 $\text{hyp} = \frac{35}{\cos 36^\circ} = 43.2624 \text{ m}$

②  $\tan 68^\circ = \frac{\text{opp}}{\text{adj}}$   
 $43.2624 \tan 68^\circ = h$   
 $107.0781 \text{ m} = h$

Calculate the height of the cliff on the other side of the stream.

- a. 17.5 m
- b. 62.9 m
- c. 70.1 m
- d. 107.1 m

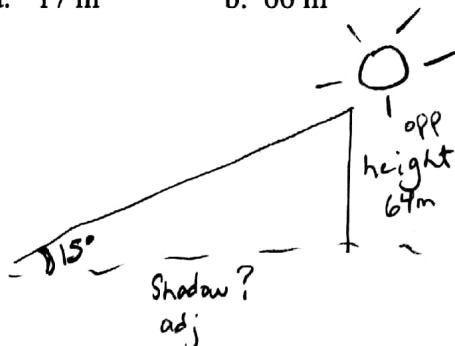
24. A road sign says to turn right in 1000 feet. Approximately how far is this distance in kilometres?

- a. 0.3 km
- b. 0.6 km
- c. 1 km
- d. 1.5 km

$$1000 \text{ ft} \cdot \frac{1 \text{ yd}}{3 \text{ ft}} \cdot \frac{0.9144 \text{ m}}{1 \text{ yd}} \cdot \frac{1 \text{ km}}{1000 \text{ m}} = 0.3048 \text{ km}$$

25. The angle of elevation of the sun is 15°. How long is the shadow of a 64 m tall building?

- a. 17 m
- b. 66 m
- c. 239 m
- d. 247 m



$$\tan 15^\circ = \frac{64 \text{ m}}{\text{Shadow}}$$

$$\frac{\text{Shadow} \tan 15^\circ}{\tan 15^\circ} = \frac{64 \text{ m}}{\tan 15^\circ}$$

$$\text{Shadow} = 238.8513 \text{ m}$$