

GMF – Geo & Measurement Practice Q's

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ___ 1. The driving distance from Yellowknife, NWT, to Whitehorse, YT, is 2704 km. What is this distance in miles?
 - a. 1352 miles
 - b. 1690 miles
 - c. 4326 miles
 - d. 901 miles

- ___ 2. What is the surface area of a cube that measures 16" on each side?
 - a. 2048 in^2
 - b. 1536 in^2
 - c. 1024 in^2
 - d. 256 in^2

- ___ 3. The exterior of a lamp post is to be painted. The lamp post is a 14-foot tall cylinder with a diameter of 18 inches. Since the base is on the ground and the top is covered by a floodlight, you will not need to paint these pieces. What is the area that needs to be painted?
 - a. 113 in^2
 - b. 9500 in^2
 - c. 792 in^2
 - d. 10009 in^2

- ___ 4. Water freezes at 0°C . What is the freezing point of water in degrees Fahrenheit?
 - a. 32°F
 - b. -32°F
 - c. 100°F
 - d. 0°F

- ___ 5. A pot of water is being boiled at high altitude and has reached a temperature of 217°F . If the boiling point of water at this altitude is 105°C , by how many more degrees must the water heat up?
 - a. 10°F
 - b. 7°F
 - c. None. It is already boiling.
 - d. 4°F

- ___ 6. At the bank, penny rolls are weighed to determine the amount of money they contain. If 1 penny weighs 2.35 g, how much money is in a pile of rolls weighing 5.55 kg?
 - a. \$25.97
 - b. \$29.04
 - c. \$18.42
 - d. \$23.61

- ___ 7. Painted Rock Farms owns land measuring 1100 m by 925 m. They would like to grow their crops in separate fields of $47\,500 \text{ m}^2$. How many different fields can they fence off?
 - a. 23
 - b. 17
 - c. 21
 - d. 27

- ___ 8. A transversal intersects two parallel lines. If one angle is 153° , what will the alternate interior angle be?
 - a. 146°
 - b. 153°
 - c. 77°
 - d. 27°

- ___ 9. Two interior angles lie on the same side of a transversal that intersects two parallel lines. If one angle is 60° , what will the other angle be?
 - a. 30°
 - b. 30°
 - c. 120°
 - d. 67°

- ___ 10. Which of the following is not a Pythagorean triple?
 - a. 9, 11, 17
 - b. 7, 24, 25
 - c. 8, 15, 17
 - d. 3, 4, 5

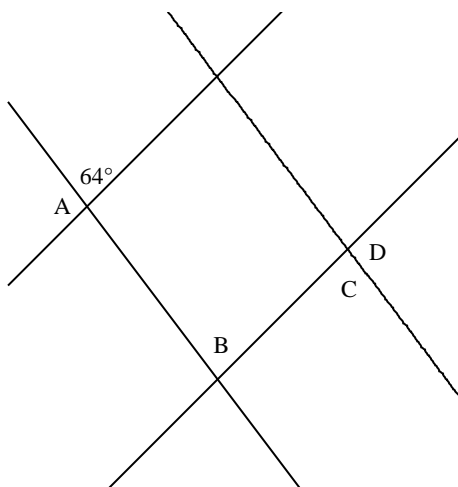
- _____ 11. A park is 45 m long by 30 m wide. When travelling between opposite corners, how much shorter is it to walk diagonally across the park instead of walking along its sides?
- a. 26 m c. 51 m
b. 54 m d. 21 m

Short Answer

1. A garden measures 14 yd by 10 yd. In order to grow well, vegetables need about 0.8 m^2 of space each. How many plants can you expect to grow in the garden?
2. A birdwatcher spots a bird that is perched on a branch 9.3 m off the ground. The angle of elevation is 21° . What is the shortest distance between the birdwatcher and the bird?
3. A mountain is 1300 m tall and its peak is 1774 m up the side of the hill. At what angle does the mountain rise?

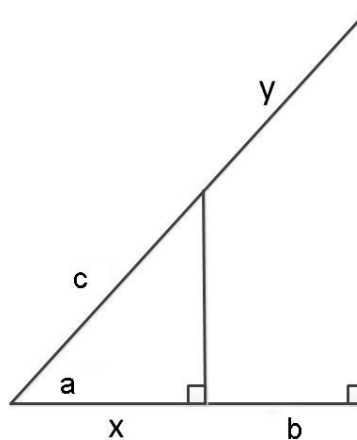
Problem

1. Allannah can kick a rugby ball 72 feet. Cory is standing 27 metres away. Will the ball reach Cory?
2. The roof of Juan's house is a triangular prism. The two long rectangular sides and the triangular front and back of the roof need to be reshingled. The roof measures 60 ft long and the slant height is 27 ft. The front and back triangles have a base of 50 ft and a height of 7 ft. The contractor charges \$450.00 for labour and the shingles are sold in bundles that cover 25 ft^2 which each cost \$14.99. What is the total cost to shingle the roof?
3. A garden measuring 7 m by 6 m is to be covered in 15 cm of topsoil. Bags of topsoil cost \$7.99 per bag and hold 5 ft^3 of topsoil. How much will the topsoil for this garden cost?
4. In the diagram below, opposing lines are parallel. Determine the value of $\angle B$. Explain your reasoning.



5. The diagram below has the following dimensions:
 $a = 53^\circ$
 $b = 44 \text{ cm}$
 $c = 80 \text{ cm}$

Find the lengths of x and y .



Answer Section

MULTIPLE CHOICE

- ANS: B PTS: 1 DIF: Easy REF: 3.2
OBJ: Measurement LOC: M-SO1 TOP: Converting Measurements
KEY: Converting from SI to imperial units
- ANS: B PTS: 1 DIF: Easy REF: 3.3
OBJ: Measurement | Algebra LOC: M-SO4 | A-SO1
TOP: Surface Area KEY: Surface Area
- ANS: B PTS: 1 DIF: Moderate REF: 3.3
OBJ: Measurement | Algebra LOC: M-SO4 | A-SO1
TOP: Surface Area KEY: Surface Area
- ANS: A PTS: 1 DIF: Easy REF: 4.1
OBJ: Measurement LOC: M-SO1 TOP: Temperature Conversions
KEY: Converting from Celsius to Fahrenheit
- ANS: D PTS: 1 DIF: Easy REF: 4.1
OBJ: Measurement LOC: M-SO2 TOP: Temperature Conversions
KEY: Converting from Fahrenheit to Celsius
- ANS: D PTS: 1 DIF: Difficult REF: 4.4
OBJ: Measurement LOC: M-SO1 TOP: Making Conversions
KEY: Converting between SI units
- ANS: C PTS: 1 DIF: Easy REF: 4.4
OBJ: Measurement LOC: M-SO1 TOP: Making Conversions
KEY: SI units
- ANS: B PTS: 1 DIF: Easy REF: 5.4
OBJ: Geometry LOC: G-SO5 TOP: Parallel Lines and Transversals
KEY: Alternate interior angles
- ANS: C PTS: 1 DIF: Moderate REF: 5.4
OBJ: Geometry LOC: G-SO5 TOP: Parallel Lines and Transversals
KEY: Interior angles on the same side of the transversal
- ANS: A PTS: 1 DIF: Easy REF: 7.1
OBJ: Geometry LOC: G-SO2 TOP: The Pythagorean Theorem
KEY: Pythagorean Theorem
- ANS: D PTS: 1 DIF: Moderate REF: 7.1
OBJ: Algebra | Geometry LOC: A-SO1 | G-SO2
TOP: The Pythagorean Theorem KEY: Pythagorean Theorem

SHORT ANSWER

- ANS:
Convert the dimensions of the garden to metres.
 $1 \text{ yd} = 0.9144 \text{ m}$

Length:
 $14 \text{ yd} \times 0.9144 \text{ m/yd} = 12.8016 \text{ m}$

Width:

$$10 \text{ yd} \times 0.9144 \text{ m/yd} = 9.144 \text{ m}$$

Calculate the area of garden.

$$A = lw$$

$$A = 12.8016 \times 9.144$$

$$A \approx 117.1 \text{ m}^2$$

Divide the area by the space needed per plant.

$$117.1 \div 0.8 \approx 146.38$$

You can grow about 146 vegetables in the garden.

PTS: 1 DIF: Moderate REF: 3.3 OBJ: Measurement | Algebra
LOC: M-SO2 | M-SO4 | A-SO1 TOP: Surface Area
KEY: Surface Area

2. ANS:

$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 21^\circ = \frac{9.3}{\text{hyp}}$$

$$\text{hyp} = \frac{9.3}{\sin 21^\circ}$$

$$\text{hyp} = 26.0 \text{ m}$$

The bird is 26.0 m away.

PTS: 1 DIF: Moderate REF: 7.2 OBJ: Algebra | Geometry
LOC: A-SO1 | G-SO4 TOP: The Sine Ratio
KEY: Sine ratio

3. ANS:

$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin A = \frac{1300}{1774}$$

$$A = \sin^{-1}\left(\frac{1300}{1774}\right)$$

$$A = 47.1^\circ$$

The mountain rises at an angle of 47.1° .

PTS: 1 DIF: Easy REF: 7.5 OBJ: Algebra | Geometry
LOC: A-SO1 | G-SO4 TOP: Finding Angles and Solving Right Triangles
KEY: Inverse trigonometric function

PROBLEM

1. ANS:

Convert the distance in feet to metres.

$$1 \text{ ft} = 0.3048 \text{ m}$$

$$72 \text{ ft} \times 0.3048 \text{ m/ft} = 21.95 \text{ m}$$

The ball will not reach Cory.

PTS: 1

DIF: Moderate REF: 3.2

OBJ: Measurement

LOC: M-SO2

TOP: Converting Measurements

KEY: Converting from imperial to SI units

2. ANS:

Calculate the surface area to be shingled.

There are two rectangles measuring 60 ft by 27 ft.

$$A_{\text{rectangles}} = 2lw$$

$$A_{\text{rectangles}} = 2(60 \times 27)$$

$$A_{\text{rectangles}} = 3240 \text{ ft}^2$$

There are two triangular areas.

$$A_{\text{triangles}} = 2\left(\frac{bh}{2}\right)$$

$$A_{\text{triangles}} = bh$$

$$A_{\text{triangles}} = 50 \times 7$$

$$A_{\text{triangles}} = 350 \text{ ft}^2$$

Calculate the total area needing shingles.

$$SA = A_{\text{rectangles}} + A_{\text{triangles}}$$

$$SA = 3240 + 350$$

$$SA = 3590 \text{ ft}^2$$

To calculate the number of packs of shingles needed, divide the area by the area per package.

$$3590 \text{ ft}^2 \div 25 \text{ ft}^2 \approx 144$$

144 packages of shingles are needed.

Calculate the cost of the shingles.

$$\$14.99 \times 144 = \$2158.56$$

Calculate the total cost.

Total cost = cost of shingles + cost of labour

$$\text{Total cost} = \$2158.56 + \$450.00$$

$$\text{Total cost} = \$2608.56$$

It will cost \$2608.56 to shingle the roof.

PTS: 1 DIF: Difficult REF: 3.3 OBJ: Measurement | Algebra
LOC: M-SO4 | A-SO1 TOP: Surface Area
KEY: Surface Area

3. ANS:

Convert the dimensions of the garden to feet.

1 m ? 3.2808 ft

Length: $7 \text{ m} \times 3.2808 \text{ ft/m} \approx 22.97 \text{ ft}$

Width: $6 \text{ m} \times 3.2808 \text{ ft/m} \approx 19.68 \text{ ft}$

Depth: $15 \text{ cm} \times 0.3937 \text{ in/cm} \div 12 \text{ in/ft} \approx 0.49 \text{ ft}$

Calculate the volume of topsoil needed.

$$V = lwd$$

$$V = 22.97 \times 19.68 \times 0.49$$

$$V \approx 222.48 \text{ cu ft}$$

Calculate the number of bags of topsoil needed.

$$222.48 \div 5 \text{ ft}^3/\text{bag} \approx 45 \text{ bags, rounded up}$$

Calculate the cost.

$$45 \text{ bags} \times \$7.99 = \$359.55$$

The topsoil for the garden will cost \$359.55.

PTS: 1 DIF: Difficult REF: 3.4 OBJ: Measurement
LOC: M-SO1 | M-SO3 TOP: Volume
KEY: Converting from SI to imperial units

4. ANS:

$\angle B$ is a corresponding angle to the 64° angle. When two parallel lines are intersected by a transversal, corresponding angles are equal. Therefore, $\angle B$ is 64° .

PTS: 1 DIF: Moderate REF: 5.4 OBJ: Geometry
LOC: G-SO5 TOP: Parallel Lines and Transversals KEY: Corresponding angles

5. ANS:

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

$$\cos 53^\circ = \frac{x}{80}$$

$$80 \cos 53^\circ = x$$

$$48.1 \text{ cm} = x$$

Calculate the length of the bottom of the large triangle.

$$x + b = 48.1 + 44$$
$$x + b = 92.1 \text{ cm}$$

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

$$\cos 53^\circ = \frac{92.1}{c + y}$$

$$c + y = \frac{92.1}{\cos 53^\circ}$$

$$c + y = 153.0$$

$$y = 153.0 - c$$

$$y = 153.0 - 80$$

$$y = 73.0 \text{ cm}$$

The measure of x is 48.1 cm and the measure of y is 73.0 cm.

PTS: 1 DIF: Difficult REF: 7.3 OBJ: Algebra | Geometry
LOC: A-SO1 | G-SO4 TOP: The Cosine Ratio
KEY: Cosine ratio