Math 10 GMF Exam Review

Geometry Unit - Chapters 7, 8

Multiple Choice

____ 1. What is the tangent of 24°?

a. 0.441
b. 0.407
c. 0.914
d. 0.445

____ 2. A carpet has side lengths of 3.2 m and 4.6 m. What is the distance between opposite corners of the carpet?

a. 3.3 m
b. 2.8 m
c. 5.6 m
d. 7.9 m

____ 3. 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
b. 54 m
c. 51 m
d. 21 m

____ 4. The sine ratio relates to which two sides of a right triangle?

a. The side opposite a given angle and the hypotenuse.
b. The side adjacent to a given angle and the hypotenuse.
c. The side adjacent to a given angle and the opposite side.
d. The side adjacent to a given angle and the vertical side.

____ 5. What is the sine of 19°?

a. 0.946
b. 0.344
c. 0.360
d. 0.326

____ 6. A right triangle has a hypotenuse of 35 cm. If one of the angles is 74°, what is the length of the opposite side?

a. 33.64 cm
b. 34.85 cm
c. 122.06 cm
d. 9.65 cm

____ 7. A right triangle has an angle of 15° and the opposite side is 28 cm. What is the length of the hypotenuse?

a. 28.99 cm
b. 119.48 cm
c. 104.50 cm
d. 108.18 cm

____ 8. The cosine ratio relates to which two sides of a right triangle?

a. The side adjacent to a given angle and the vertical side.
b. The side adjacent to a given angle and the hypotenuse.
c. The side adjacent to a given angle and the opposite side.
d. The side opposite a given angle and the hypotenuse.

____ 9. What is the cosine of 59°?

a. 0.857
b. 0.515
c. 1.664
d. 0.891

____ 10. A right triangle has a hypotenuse of 1.4 cm. If one of the angles is 45°, what is the adjacent side?

a. 0.99 cm
b. 1.40 cm
c. 0.99 cm
d. 2.2 cm

____ 11. If a right triangle has a hypotenuse of 50 cm and an angle of 70°, what is the length of the side adjacent to the given angle?

a. 46.98 cm
b. 137.37 cm
c. 17.10 cm
d. 20.20 cm

____ 12. The tangent ratio relates to which two sides of a right triangle?

a. The side adjacent to a given angle and the hypotenuse.
b. The side adjacent to a given angle and the vertical side.
c. The side opposite a given angle and the adjacent side.
d. The side opposite a given angle and the hypotenuse.

____ 13. A right triangle has an angle of 53°. If the opposite side is 6.4 cm long, what is the length of the adjacent side?

a. 4.0 cm
b. 8.5 cm
c. 4.8 cm
d. 8.0 cm

____ 14. What is $\sin^{-1}(0.28)$?

a. 16.26°
b. 15.64°
c. 73.74°
d. 47.46°

____ 15. What is $\cos^{-1}(0.57)$?

a. 29.68°
b. 65.95°
c. 55.25°
d. 34.75°

____ 16. What is $\tan^{-1}(1.03)$?

a. 40.25°
b. 31.20°
c. 59.52°
d. 45.85°

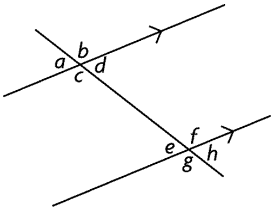
____ 17. The hypotenuse of a right triangle is 20.8 cm and one leg is 4.2 cm long. What is the angle adjacent to the 4.2 cm side?

a. 11.65°
b. 90.65°
c. 78.35°
d. 11.42°

____ 18. The hypotenuse of a right triangle is 23.96 cm and one leg is 11.09 cm long. What is the angle opposite to the 11.09 cm side?

a. 24.84°
b. 27.57°
c. 62.43°
d. 39.87°

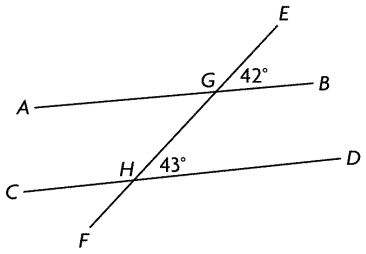
____ 19. Which pairs of angles are equal in this diagram?



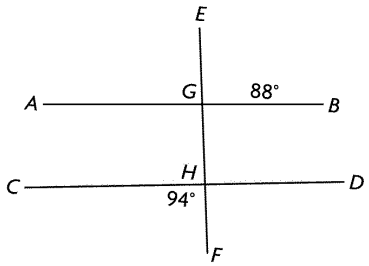
a. $a = b$, $c = d$, and $e = f$
b. $a = e$, $c = g$, and $b = f$
c. $a = c$, $e = g$, and $f = h$
d. $a = e$, $b = d$, and $c = g$

____ 20. In which diagram(s) is *AB* parallel to *CD*?

1.

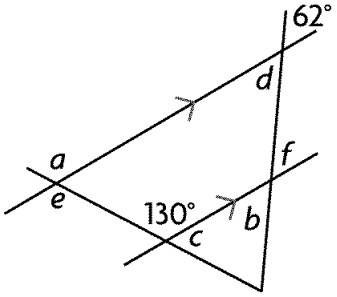


2.



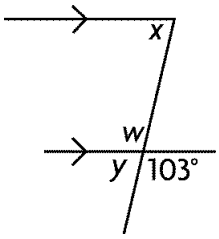
a. Choice 1 only
b. Choice 2 only
c. Choice 1 and Choice 2
d. Neither Choice 1 nor Choice 2

____ 21. Which statement about the angles in this diagram is false?



a. □*b* = 50°
b. □*c* = 50°
c. □*e* = 130°
d. □*f* = 62°

____ 22. Which are the correct measures of the indicated angles?



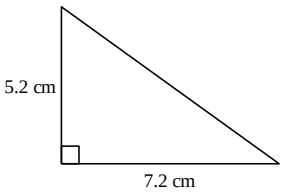
a. □*w* = 77°, □*x* =77°, □*y* = 103°
b. □*w* = 77°, □*x* =103°, □*y* = 103°
c. □*w* = 103°, □*x* =77°, □*y* = 77°
d. □*w* = 103°, □*x* =103°, □*y* = 77°

Short Answer

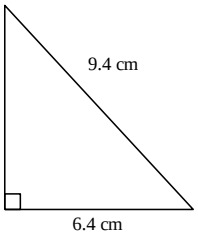
1. The steps of a stepladder rise at an incline of 60°. If the base of the ladder is 0.62 m long, how tall is the stepladder?

2. Will a pencil that is 15 cm long fit into a pencil case that is 13 cm long and 10 cm wide?

3. Solve for the unknown side length.



4. Solve for the unknown side length.

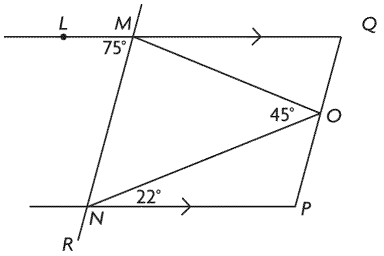


5. A right triangle has a hypotenuse of 24 m. If one of the angles is 54°, what is the length of the opposite side?

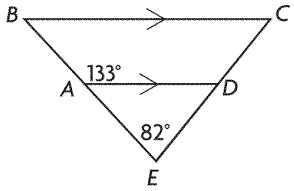
6. A ladder 11 ft long lowers men into a manhole at an angle of depression of 61.7°. What is the depth of the manhole?

7. 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?

8. Determine the measure of □*MNO*.



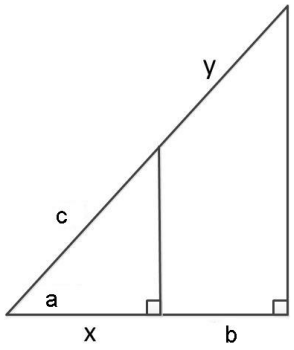
9. Determine the unknown angles.



Problem

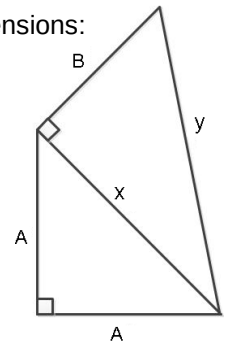
1. The diagram to the right has the following dimensions:
   a = 54°
   b = 38 cm
   c = 86 cm

   Find the lengths of *x* and *y*.

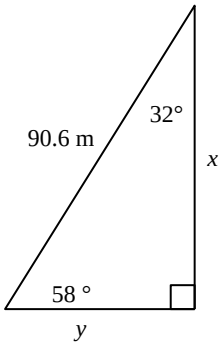


2. The diagram below has the following dimensions:
   A = 5 cm
   B = 4 cm

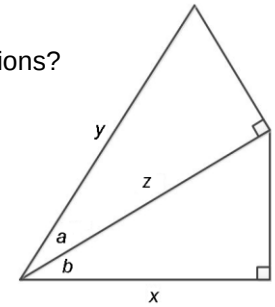
   Find the length of *y*.



3. Find *x* and *y* to one decimal place, using sine ratios.



4. What are the lengths of *x* and *y* in the diagram to the right, given the following dimensions?
   a = 30°
   b = 25°
   z = 30 cm



5. A new ramp is being built with an angle of elevation of 10°. If the height of the ramp is 2.5 m, what is the length of the base of the ramp?

Math 10 GMF Exam Review
Geometry Unit - Chapters 7, 8
Solutions

MULTIPLE CHOICE

1. ANS: D
2. ANS: C
3. ANS: D
4. ANS: A
5. ANS: D
6. ANS: A
7. ANS: D
8. ANS: B
9. ANS: B
10. ANS: A
11. ANS: C
12. ANS: C
13. ANS: C
14. ANS: A
15. ANS: C
16. ANS: D
17. ANS: C
18. ANS: B
19. ANS: B
20. ANS: D
21. ANS: A
22. ANS: C

SHORT ANSWER

1. ANS:

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

$$\tan 60° = \frac{\text{opp}}{0.62}$$

$$0.62 \tan 60° = \text{opp}$$

$$1.1 \text{ m} = \text{opp}$$

The stepladder is 1.1 m tall.

2. ANS:
Calculate the diagonal for the pencil case.

$$d^2 = 13^2 + 10^2$$

$$d^2 = 169 + 100$$

$$d^2 = 269$$

$$d = \sqrt{269}$$

$$d = 16.4 \text{ cm}$$

Yes, the pencil will fit in the case.

3. ANS:

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

$$c^2 = 7.2^2 + 5.2^2$$

$$c^2 = 51.84 + 27.04$$

$$c^2 = 78.88$$

$$c = \sqrt{78.88}$$

$$c = 8.9 \text{ cm}$$

The hypotenuse is 8.9 cm long.

4. ANS:

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

$$6.4^2 + b^2 = 9.4^2$$

$$b^2 = 9.4^2 - 6.4^2$$

$$b^2 = 88.36 - 40.96$$

$$b^2 = 47.4$$

$$b = \sqrt{47.4}$$

$$b = 6.9 \text{ cm}$$

The side is 6.9 cm long.

5. ANS:

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

$$\sin 54° = \frac{\text{opp}}{24}$$

$$24 \sin 54° = \text{opp}$$

$$19.42 \text{ m} = \text{opp}$$

The length of the opposite side is 19.42 m.

6. ANS:

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

$$\sin 61.7° = \frac{\text{opp}}{11}$$

$$11 \sin 61.7° = \text{opp}$$

$$9.7 \text{ ft} = \text{opp}$$

The manhole is 9.7 m deep.

7. ANS:

$$\sin A = \frac{opp}{hyp}$$
$$= \frac{1300}{1774}$$
$$A = \sin^{-1}(0.7328)$$
$$\doteq 47^{\circ}$$

The mountain rises at an angle of 47°.

8. ANS:

$$\angle MNO = 75^{\circ} - 22^{\circ}$$
$$= 53^{\circ}$$

9. ANS:

$$\angle CBA = 47^{\circ}$$
$$\angle DAE = 47^{\circ}$$
$$\angle ADC = 129^{\circ}$$
$$\angle BCD = 51^{\circ}$$
$$\angle ADE = 180^{\circ} - (82^{\circ} + 47^{\circ}) = 51^{\circ}$$

PROBLEM

1. ANS:

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

$$\cos 54° = \frac{x}{86}$$

$$86 \cos 54° = x$$

$$50.5 \text{ cm} = x$$

Calculate the length of the bottom of the large triangle.
$x + b = 50.5 + 38$
$x + b = 88.5$ cm

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

$$\cos 54° = \frac{88.5}{c + y}$$

$$c + y = \frac{88.5}{\cos 54°}$$

$$c + y = 150.6$$

$$y = 150.6 - c$$

$$y = 150.6 - 86$$

$$y = 64.6 \text{ cm}$$

The measure of x is 50.5 cm and the measure of y is 64.6 cm.

2. ANS:

$$x^2 = A^2 + A^2$$

$$x^2 = 5^2 + 5^2$$

$$x^2 = 50$$

$$y^2 = x^2 + B^2$$

$$y^2 = 50 + 4^2$$

$$y^2 = 50 + 16$$

$$y^2 = 66$$

$$y = \sqrt{66}$$

$$y = 8.12 \text{ cm}$$

The length of y is 8.12 cm.

3. ANS:
Solve for *x* using the 58.0° angle and the hypotenuse.

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

$$\sin 58.0° = \frac{x}{90.6}$$

$$90.6 \sin 58.0° = x$$

$$76.8 \text{ m} = x$$

Solve for *y* using the 32.0° angle and the hypotenuse.

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

$$\sin 32.0° = \frac{y}{90.6}$$

$$90.6 \sin 32.0° = y$$

$$48 \text{ m} = y$$

The measure of *x* is 76.8 m and the measure of *y* is 48 m.

4. ANS:

$$\cos A = \frac{\text{adj}}{\text{hyp}} \qquad \cos B = \frac{\text{adj}}{\text{hyp}}$$

$$\cos a = \frac{z}{y} \qquad \cos b = \frac{x}{z}$$

$$\cos 30° = \frac{30}{y} \qquad \cos 25° = \frac{x}{30}$$

$$y = \frac{30}{\cos 30°} \qquad 30 \cos 25° = x$$

$$y = 34.6 \text{ cm} \qquad 27.2 \text{ cm} = x$$

The measure of *x* is 27.2 cm and the measure of *y* is 34.6 cm.

5. ANS:

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

$$\tan 10° = \frac{2.5}{\text{adj}}$$

$$\text{adj} = \frac{2.5}{\tan 10°}$$

$$\text{adj} = 14.2 \text{ m}$$

The ramp's base is 14.2 m long.