

Ch 7 Review for Final

Multiple Choice

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

- _____ 1. In order to use the Pythagorean theorem, what must be true about a given triangle?
- a. The triangle must be a right triangle, with one angle being 90° .
 - b. The sum of the interior angles of the triangle must add to 180° .
 - c. The triangle must be an acute triangle, with one angle being 45° .
 - d. The triangle must be an obtuse triangle, with one angle being 135° .
- _____ 2. What is the sine of 47° ?
- a. 0.682
 - b. 1.072
 - c. 0.731
 - d. 0.765
- _____ 3. What is the cosine of 55° ?
- a. 0.574
 - b. 0.819
 - c. 1.428
 - d. 0.853
- _____ 4. A right triangle has an angle of 59° and the adjacent side is 30 cm. What is the hypotenuse?
- .
- a. 35.00 cm
 - b. 18.03 cm
 - c. 46.30 cm
 - d. 58.25 cm
- _____ 5. A right triangle has an angle of 62° . If the opposite side is 57 cm long, what is the length of the adjacent side?
- .
- a. 34.0 cm
 - b. 60.6 cm
 - c. 30.3 cm
 - d. 64.6 cm
- _____ 6. The hypotenuse of a right triangle is 67 cm and one leg is 44 cm long. What is the angle adjacent to the 44 cm side?
- .
- a. 41.05°
 - b. 61.25°
 - c. 48.95°
 - d. 33.29°

Name: _____

ID: A

- _____ 7. Which side of a right triangle will be the longest if $\tan A$ is equal to 2?
- a. hypotenuse
 - b. opposite side
 - c. corresponding side
 - d. adjacent side
- _____ 8. 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
- _____ 9. 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
- _____ 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. 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.
- _____ 12. What is the tangent of 40° ?
- a. 0.766
 - b. 0.839
 - c. 0.643
 - d. 0.677
- _____ 13. What does an inverse trigonometric function solve for?
- a. Length of hypotenuse
 - b. Length of the adjacent side
 - c. Length of the opposite side
 - d. Angle

Name: _____

ID: A

____ 14. A right triangle has an angle of 15° . If the opposite side is 67 cm long, what is the length of the adjacent side?

- a. 250.0 cm
- b. 258.9 cm

- c. 253.7 cm
- d. 254.9 cm

____ 15. What is $\sin^{-1}(0.28)$?

- a. 16.26°
- b. 15.64°

- c. 73.74°
- d. 47.46°

____ 16. What is $\cos^{-1}(0.57)$?

- a. 29.68°
- b. 65.95°

- c. 55.25°
- d. 34.75°

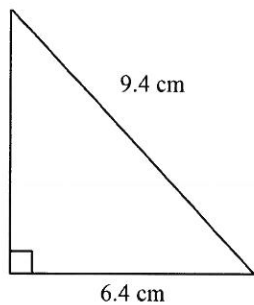
____ 17. What is $\tan^{-1}(1.03)$?

- a. 40.25°
- b. 31.20°

- c. 59.52°
- d. 45.85°

Short Answer

1. Solve for the unknown side length.



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

3. If one of the angles of a right triangle is 80° and the adjacent side is 30.6 m, what is the length of the opposite side?

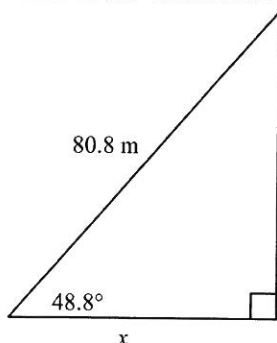
Name: _____

ID: A

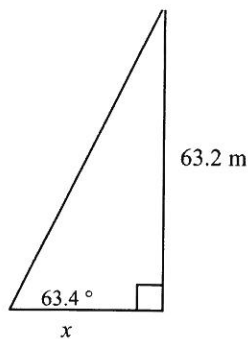
Problem

1. What are the interior angles of a triangle whose sides make the Pythagorean triple of 3, 4, 5?
2. A woman in a hot air balloon sees a deer in a field below, at an angle of depression of 34.3° . The horizontal distance from the deer to the balloon is 51 m. How far above the ground is the hot air balloon?

3. What is the value of x ?



4. Find x to one decimal place.



Name: _____

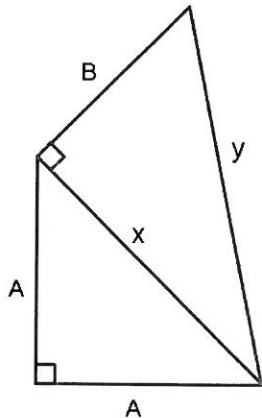
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5. The diagram below has the following dimensions:

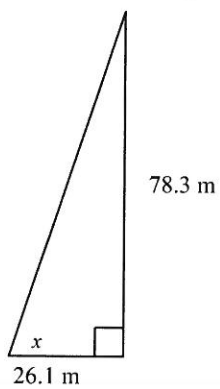
$$A = 5 \text{ cm}$$

$$B = 4 \text{ cm}$$

Find the length of y .



6. Find x in the diagram below.



15. ANS: A PTS: 1 DIF: Easy REF: 7.5
 OBI: Algebra LOC: A-SO1 TOP: Finding Angles and Solving Right Triangles
 KEY: Inverse trigonometric function
16. ANS: C PTS: 1 DIF: Easy REF: 7.5
 OBI: Algebra LOC: A-SO1 TOP: Finding Angles and Solving Right Triangles
 KEY: Inverse trigonometric function
17. ANS: D PTS: 1 DIF: Easy REF: 7.5
 OBI: Algebra LOC: A-SO1 TOP: Finding Angles and Solving Right Triangles
 KEY: Inverse trigonometric function

SHORT ANSWER

1. ANS:
 $a^2 + b^2 = c^2$
 $6.4^2 + b^2 = 9.4^2$
 $b^2 = 9.4^2 - 6.4^2$
 $b^2 = 88.36 - 40.96$
 $b^2 = 47.4$
 $b = \sqrt{47.4}$
 $b = 6.9$ cm

The side is 6.9 cm long.

- PTS: 1 DIF: Easy REF: 7.1 OBI: Algebra | Geometry
 LOC: A-SO1 | G-SO2 TOP: The Pythagorean Theorem
 KEY: Pythagorean Theorem
2. ANS:
 $\sin A = \frac{\text{opp}}{\text{hyp}}$
 $\sin 54^\circ = \frac{\text{opp}}{24}$
 $24 \sin 54^\circ = \text{opp}$
 $19.42 \text{ m} = \text{opp}$

The length of the opposite side is 19.42 m.

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

Ch 7 Review for Final Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1 DIF: Easy REF: 7.1
 OBI: Geometry LOC: G-SO2 TOP: The Pythagorean Theorem
 KEY: Pythagorean Theorem
2. ANS: C PTS: 1 DIF: Easy REF: 7.2
 OBI: Geometry LOC: G-SO4 TOP: The Sine Ratio
 KEY: Sine ratio
3. ANS: A PTS: 1 DIF: Easy REF: 7.3
 OBI: Geometry LOC: G-SO4 TOP: The Cosine Ratio
 KEY: Cosine ratio
4. ANS: D PTS: 1 DIF: Moderate REF: 7.3
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Cosine Ratio
 KEY: Cosine ratio
5. ANS: C PTS: 1 DIF: Moderate REF: 7.4
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Tangent Ratio
 KEY: Tangent ratio
6. ANS: C PTS: 1 DIF: Easy REF: 7.5
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: Finding Angles and Solving Right Triangles
 KEY: Inverse trigonometric function
7. ANS: A PTS: 1 DIF: Moderate REF: 7.4
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Tangent Ratio
 KEY: Tangent ratio
8. ANS: D PTS: 1 DIF: Moderate REF: 7.1
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO2
 TOP: The Pythagorean Theorem
 KEY: Pythagorean Theorem
9. ANS: A PTS: 1 DIF: Moderate REF: 7.2
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Sine Ratio
 KEY: Sine ratio
10. ANS: A PTS: 1 DIF: Moderate REF: 7.3
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Cosine Ratio
 KEY: Cosine ratio
11. ANS: C PTS: 1 DIF: Easy REF: 7.4
 OBI: Geometry LOC: G-SO4 TOP: The Tangent Ratio
 KEY: Tangent ratio
12. ANS: B PTS: 1 DIF: Easy REF: 7.4
 OBI: Geometry LOC: G-SO4 TOP: The Tangent Ratio
 KEY: Tangent ratio
13. ANS: D PTS: 1 DIF: Easy REF: 7.5
 OBI: Geometry LOC: G-SO5 TOP: Finding Angles and Solving Right Triangles
 KEY: Inverse trigonometric function
14. ANS: A PTS: 1 DIF: Moderate REF: 7.4
 OBI: Algebra | Geometry LOC: A-SO1 | G-SO4
 TOP: The Tangent Ratio
 KEY: Tangent ratio

3. ANS:

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

$$\tan 80^\circ = \frac{\text{opp}}{30.6}$$

$$30.6 \tan 80^\circ = \text{opp}$$

$$173.5 \text{ m} = \text{opp}$$

The length of the opposite side is 173.5 m.

PTS: 1 DIF: Easy

LOC: A-SO1 | G-SO4

KEY: Tangent ratio

REF: 7.4

TOP: The Tangent Ratio

OBJ: Algebra | Geometry

PROBLEM

1. ANS:

The solution can be calculated using any of the three trigonometric ratios.

Method 1: Use the lengths of the two legs, and solve using the tangent ratio.

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

$$\tan A = \frac{3}{4}$$

$$A = \tan^{-1}\left(\frac{3}{4}\right)$$

$$A = 36.9^\circ$$

Subtract to find the third angle.

$$180^\circ - 90^\circ - 36.9^\circ = 53.1^\circ$$

The interior angles are 90° , 36.9° and 53.1° .

The tangent ratio could also have been applied with the leg lengths in the opposite order (opp = 4, adj = 3).

Method 2: Use the length of one leg and the hypotenuse, and solve using the sine ratio.

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

$$\sin A = \frac{3}{5}$$

$$A = \sin^{-1}\left(\frac{3}{5}\right)$$

$$A = 36.9^\circ$$

Subtract to find the third angle.

$$180^\circ - 90^\circ - 36.9^\circ = 53.1^\circ$$

The interior angles are 90° , 36.9° and 53.1° .

The sine ratio could also have been applied using the other leg length (opp = 4, hyp = 5).

Method 3: Use the length of one leg and the hypotenuse, and solve using the cosine ratio.

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

$$\cos A = \frac{4}{5}$$

$$A = \cos^{-1}\left(\frac{4}{5}\right)$$

$$A = 36.9^\circ$$

Subtract to find the third angle.
 $180^\circ - 90^\circ - 36.9^\circ = 53.1^\circ$

The interior angles are 90° , 36.9° and 53.1° .

The cosine ratio could also have been applied using the other leg length (adj = 3, hyp = 5).

PTS: 1 DIF: Moderate

REF: 7.5

OBI: Algebra | Geometry

LOC: A-SO1 | G-SO2 | G-SO4

TOP: Finding Angles and Solving Right Triangles

KEY: Inverse trigonometric function

2. ANS:

Use the cosine ratio to calculate the distance from balloon to the deer (the hypotenuse of the triangle).

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

$$\cos 34.3^\circ = \frac{51}{\text{hyp}}$$

$$\text{hyp} = \frac{51}{\cos 34.3^\circ}$$

$$\text{hyp} = 61.7 \text{ m}$$

Use the Pythagorean theorem to solve for the height of the balloon.

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

$$a^2 + 51^2 = 61.7^2$$

$$a^2 = 61.7^2 - 51^2$$

$$a^2 = 1210.3$$

$$a = \sqrt{1210.3}$$

$$a = 34.8 \text{ m}$$

The balloon is 34.8 m off the ground.

PTS: 1 DIF: Moderate

REF: 7.3

OBI: Algebra | Geometry

LOC: A-SO1 | G-SO2 | G-SO4

TOP: The Cosine Ratio

KEY: Cosine ratio

5

3. ANS:

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

$$\cos 48.8^\circ = \frac{x}{80.8}$$

$$80.8 \cos 48.8^\circ = x$$

$$53.2 \text{ m} = x$$

The value of x is 53.2 m.

PTS: 1 DIF: Easy

LOC: A-SO1 | G-SO4

KEY: Cosine ratio

4. ANS:

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

$$\tan 63.4^\circ = \frac{63.2}{x}$$

$$x = \frac{63.2}{\tan 63.4^\circ}$$

$$x = 31.6 \text{ m}$$

The measure of x is 31.6 m.

PTS: 1 DIF: Easy

LOC: A-SO1 | G-SO4

KEY: Tangent ratio

REF: 7.4

TOP: The Tangent Ratio

OBI: Algebra | Geometry

6

5. 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.

PTS: 1

DIF: Moderate

REF: 7.1

OBJ: Algebra | Geometry

LOC: A-SO1 | G-SO2

TOP: The Pythagorean Theorem

KEY: Pythagorean Theorem

6. ANS:

tan A = opp

adj

$$\tan x = \frac{78.3}{26.1}$$

$$x = \tan^{-1}\left(\frac{78.3}{26.1}\right)$$

$$x = 71.6^\circ$$

The measure of x is 71.6° .

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