

Trigonometry Homework



REFERENCES:

Answers:

services.nietc.org

Khan Academy:

<https://www.khanacademy.org/math/trigonometry/trigonometry-right-triangles/intro-to-the-trig-ratios/a/opposite-adjacent-hypotenuse>

Wolfram Mathworld:

<http://mathworld.wolfram.com/Trigonometry.html>

Math is Fun:


<https://www.mathsisfun.com/algebra/trigonometry.html>



QUESTIONS:


1) One angle of a right triangle is always a ? angle.

Answer:

- a. 30°
- b. 60°
-  c. 90°
- d. 180°


2) The sum of all the angles in any triangle always equals ?.

Answer:

- e. 90°
-  f. 180°
- g. 270°
- h. 360°


3) The term ? is used to identify the reference point or angle.

Answer:

- i. adjacent
- j. hypotenuse
- k. opposite
-  l. theta


4) The side opposite the right angle is called the ? side.

Answer:

- a. adjacent
-  b. hypotenuse
- c. opposite
- d. theta


5) The side next to the reference angle is called the ? side.

Answer:

-  a. adjacent
- b. hypotenuse
- c. opposite
- d. theta


6) The side opposite the reference angle is called the ? side.

Answer:

- a. adjacent
- b. hypotenuse
-  c. opposite
- d. theta


7) The Pythagorean Theorem states that the ? of the hypotenuse of any right triangle is equal to the ? of the squares of the other two sides.

Answer:

- a. square / product
-  b. square / sum
- c. sum / square
- d. sum / sum

8) Write the Pythagorean Theorem as a mathematical formula.

Answer:


- a. $c = a^2 + b^2$
- b. $2c = 2a + 2b$
-  c. $c^2 = a^2 + b^2$
- d. $c^2 = a^2 \times b^2$

9) Solve for the values missing in the table shown:

Hypotenuse	Adjacent	Opposite
8.485	6	6
35.36	25	25
16	12.49	10
1000	800	600
335	160	294.32
14	6	12.65

10) θ in a right triangle equals 36° . What are the values of the other two angles?

Answer:

- a. $36^\circ / 90^\circ$
- b. $36^\circ / 180^\circ$
- c. $36^\circ / 54^\circ$
-  d. $90^\circ / 54^\circ$

11) The sine of θ is equal to the ? divided by the ?.

Answer:

- a. adjacent \div hypotenuse
- b. hypotenuse \div adjacent
- c. opposite \div adjacent



- d. opposite \div hypotenuse

12) Complete the following equations regarding the sin function:

$$\sin(\theta) = \text{opp/hyp}$$

$$\text{hyp} = \text{opp}/\sin(\theta)$$

$$\text{opp} = \sin(\theta) \times \text{hyp}$$

13) Minimum value of the $\sin \theta$ occurs at ? degrees?

Answer:

0°

14) Maximum value of the $\sin \theta$ occurs at ? degrees?

Answer:

90°

GIVEN THE FOLLOWING INFORMATION, SOLVE FOR THE MISSING VALUE:

15) Given: $\sin \theta = 0.8660$

Find: θ

Answer:

60°

18) Given: $\sin \theta = 0.5446$

opposite = 160

Find θ

Answer:

33°

16) Given: $\theta = 51^\circ$

opposite = 15

Find: hypotenuse

Answer:

19.3

19) Given: $\sin \theta = 0.7071$

hypotenuse = 100

Find: opposite

Answer:

70.71

17) Given: $\theta = 20^\circ$

opposite = 45

Find: hypotenuse

Answer:

131.57

20) Given: $\sin \theta = 0.46947$

hypotenuse = 36

Find: opposite

Answer:

16.9

21) If a triangle's $\sin \theta = 0.7071$ and it's hypotenuse = 100, what is the angle of theta?

Answer:

45°

22) The $\cos \theta$ is equal to the ? side divided by the ?.

Answer:

- a. adjacent \div hypotenuse
 b. hypotenuse \div adjacent
 c. opposite \div adjacent
 d. opposite \div hypotenuse

23) The maximum value of the $\cos \theta$ is equal to ?, and the minimum value is ?.

Answer:

- a. 0 / 1
 b. 0 / 90
 → c. 1 / 0
 d. 90 / 0

24) Minimum value of the $\cos \theta$ occurs at ? degrees?

Answer:

90°

25) Maximum value of the $\cos \theta$ occurs at ? degrees?

Answer:

0°

GIVEN THE FOLLOWING INFORMATION, SOLVE FOR THE MISSING VALUE:

26) Given: $\cos(\theta) = 0.891$

Find: θ

Answer:

27°

27) Given: hypotenuse = 25

adjacent = 5

Find: θ

Answer:

78.46°

28) Given: hypotenuse = 25

adjacent = 5

Find: opposite

Answer:

24.49

29) Given: hypotenuse = 150

adjacent = 90

Find: opposite

Answer:

120

30) Given: hypotenuse = 5

adjacent = 3

Find: opposite

Answer:

4

31) Given: hypotenuse = 250

adjacent = 225

Find: opposite (using angle θ)

Answer:

108.97


32) There is a triangle with a hypotenuse of 10 and an adjacent side of 7. What is the opposite side?

Answer:

7.14

33) The $\tan \theta$ is equal to the ? side divided by the ? side.

Answer:

- a. adjacent / hypotenuse
- b. hypotenuse / adjacent
-  c. opposite / adjacent
- d. opposite / hypotenuse

GIVEN THE FOLLOWING INFORMATION, SOLVE FOR THE MISSING VALUE:

34) Given: $\tan(\theta) = 0.57735$

opposite = 150

Find: adjacent

Answer:

259.8

37) Given: Angle $\theta = 20^\circ$

opposite = 11

Find: adjacent

Answer:

30.22

35) Given: Angle $\theta = 51^\circ$

opposite = 11

Find: adjacent

Answer:

8.908

38) Given: adjacent = 100

opposite = 10

Find: θ

Answer:

5.71°

36) Given: Angle $\theta = 49^\circ$

adjacent = 8

Find: opposite

Answer:

9.203

39) Given: adjacent = 10

opposite = 1,000

Find: hypotenuse (using angle θ)

Answer:

1000.05

40) If a triangle has an adjacent side of 10 and the opposite side = 10 then how long is the hypotenuse

Answer:

14.1421


41) $\tan \theta$ is sometimes referred to as the slope of a decline, or *rise*. If the pitch of a roof is 3 in 12, which means that the roof rises 3" for every 12" wide. What is the angle of this roof?

Answer:

14°

42) What would be the angle of the rise of a bridge that rose 500 feet per one-half mile?

Answer:

- a. 0.1894°
-  b. 10.7°
- c. 5.28°
- d. 79.3°

- 43) If a building casts a shadow 150 feet from its base, nearby (and out of the shadow of the building), a yardstick (put in the ground at exactly plumb) casts a shadow of 2 feet, how tall is the building? Use trigonometric functions to solve the problem.

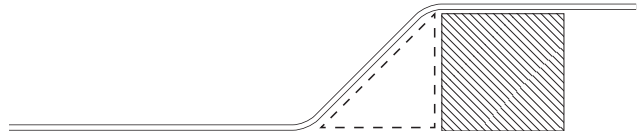
Answer:

- e. 100'
- f. 150'
- g. 225'
- h. 300'

- 44) A conduit needs a 45° offsets to avoid an obstacle 12" high. How far apart do the offset marks need to be?

Answer:

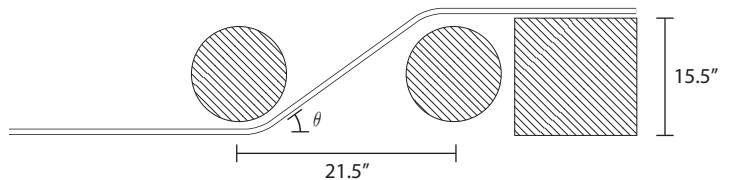
17" (16.97")



- 45) An offset is required to avoid two ducts in an exposed ceiling. Your co-worker on a scissor lift gives you dimensions of $21\frac{1}{2}"$ between the ducts and a height of $15\frac{1}{2}"$. What angle do the bends need to be made with?

Answer:

36° (35.79°)



- 46) Regarding the previous question, how far apart do the offset marks need to be?

Answer:

$26\frac{1}{2}"$