
Warm - Up

1) How many different 3 digit even numbers are there?

9 10 5

450

328

028

2) From a group of 30 people, 3 are chosen to upgrade to first class. How many ways are there to do this?

$30C3$

4,060

HHH
HHT
HTT
HTH

TTT
TTH
THT
TTH
THT

$P(\text{Exactly } \text{two tails})$

$$\frac{3}{8}$$

UNIT 9
TRIG

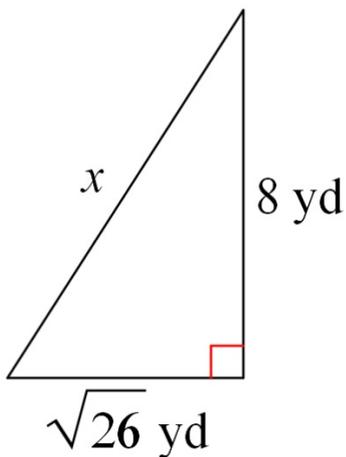
Right Triangle Review

- Pythagorean Theorem
- Special Right Triangles
- Trig Functions (SOHCAHTOA)

Pythagorean Theorem

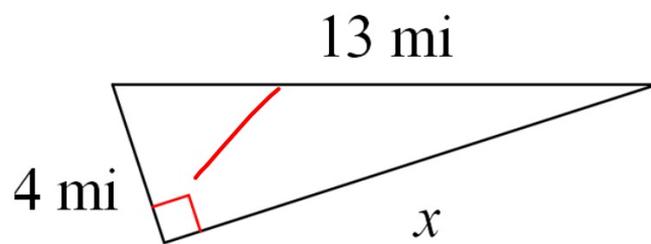
- Use when you know 2 sides of a triangle
- $a^2 + b^2 = c^2$ (where c is the hypotenuse)

Ex. 1



$$\begin{aligned}8^2 + \sqrt{26}^2 &= x^2 \\64 + 26 &= x^2 \\ \sqrt{90} &= \sqrt{x^2} \\ \sqrt{9\sqrt{10}} &= \sqrt{90} \\ &= 3\sqrt{10}\end{aligned}$$

Ex. 2



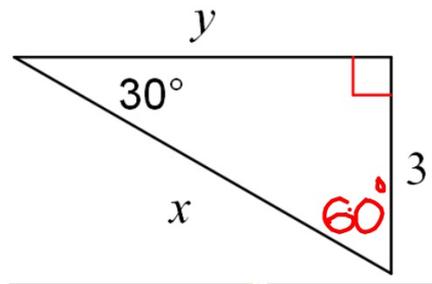
$$4^2 + x^2 = 13^2$$

$$x = 3\sqrt{17}$$

Special Right

- 30 - 60 - 90
- 45 - 45- 90 (Isosceles Right)
- Use when you know angles and one side

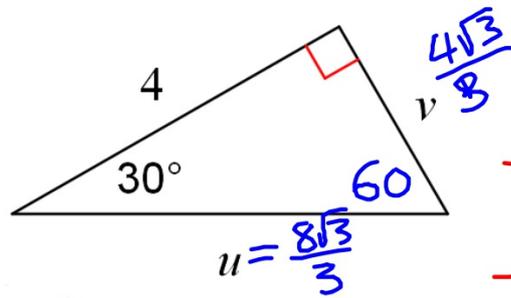
Ex.1



30	n	3
60	$n\sqrt{3}$	$3\sqrt{3}$
90	$2n$	6

$$\begin{aligned}x &= 6 \\y &= 3\sqrt{3}\end{aligned}$$

Ex. 2

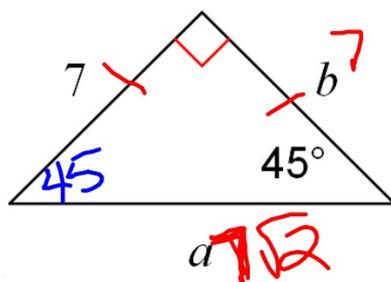


30	n	$\frac{4\sqrt{3}}{3}$
60	$n\sqrt{3}$	4
90	$2n$	$\frac{8\sqrt{3}}{3}$

$$\frac{n\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{\sqrt{3}}$$

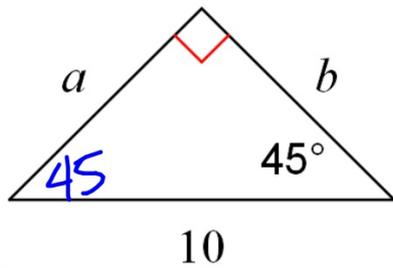
$$\frac{4\sqrt{3}}{\sqrt{9}} \quad \frac{4\sqrt{3}}{3}$$

Ex. 3



45	n	7
45	n	7
90	$n\sqrt{2}$	$7\sqrt{2}$

Ex. 4



45	n	$5\sqrt{2}$
45	n	$5\sqrt{2}$
90	$n\sqrt{2}$	10

$$\frac{n\sqrt{2}}{\sqrt{2}} = \frac{10}{\sqrt{2}}$$
$$n = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

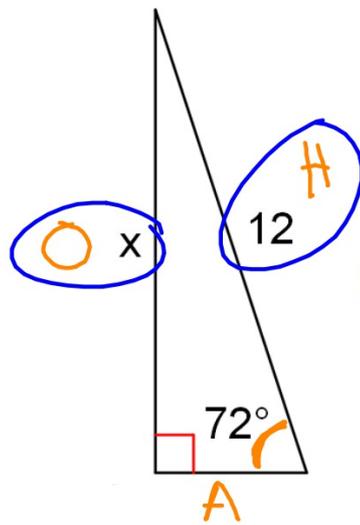
$$\frac{10\sqrt{2}}{2}$$

Trig Functions

- Use when you know one side and one angle (besides 90)
- $\text{Sin} = \frac{\text{Opposite}}{\text{Hypotenuse}}$
- $\text{Cos} = \frac{\text{Adjacent}}{\text{Hypotenuse}}$
- $\text{Tan} = \frac{\text{Opposite}}{\text{Adjacent}}$

$$\text{S} \frac{\text{O}}{\text{H}} \quad \text{C} \frac{\text{A}}{\text{H}} \quad \text{T} \frac{\text{O}}{\text{A}}$$

Ex. 1



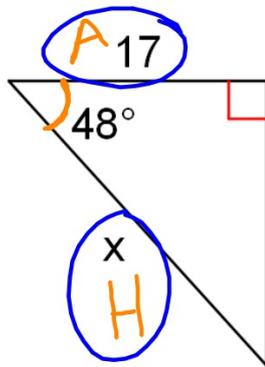
$$\frac{O}{H} = \frac{A}{H} = \frac{T}{A}$$

$$12 \cdot \sin(72) = \frac{x}{12} \cdot 12$$

$$12 \cdot \sin(72) = x$$

$$11.4 = x$$

Ex. 2

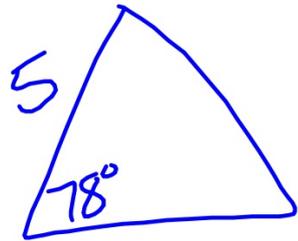


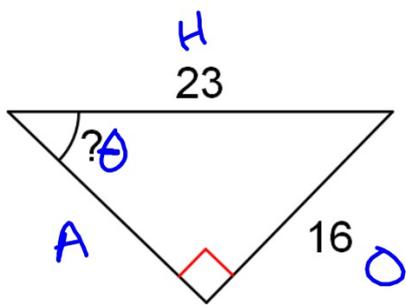
$$\frac{S^O}{H} \left(\frac{A}{H} \right) \frac{O}{A}$$

$$O \cdot \frac{\cos(48)}{\cos(48)} = \frac{17}{\cancel{X}} \cdot \cancel{X}$$

$$X = \frac{17}{\cos(48)}$$

$$X = 25.41$$





$$\sin(\theta) = \frac{O}{H}$$

$$\sin(\theta) = \frac{16}{23}$$

$$\theta = \sin^{-1}\left(\frac{16}{23}\right)$$