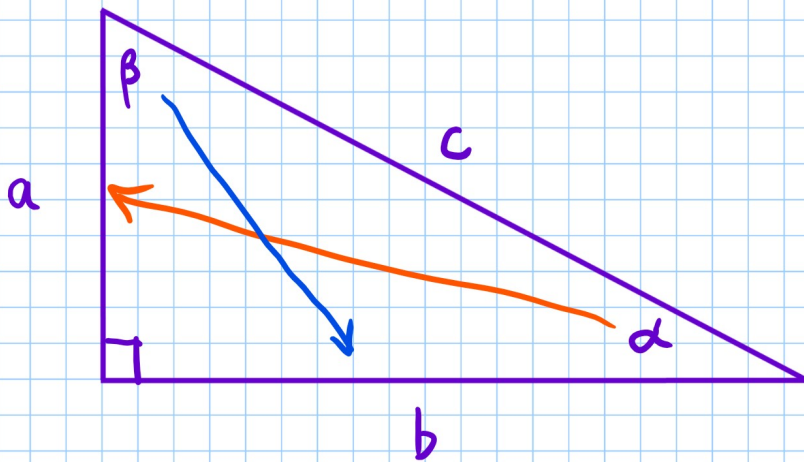
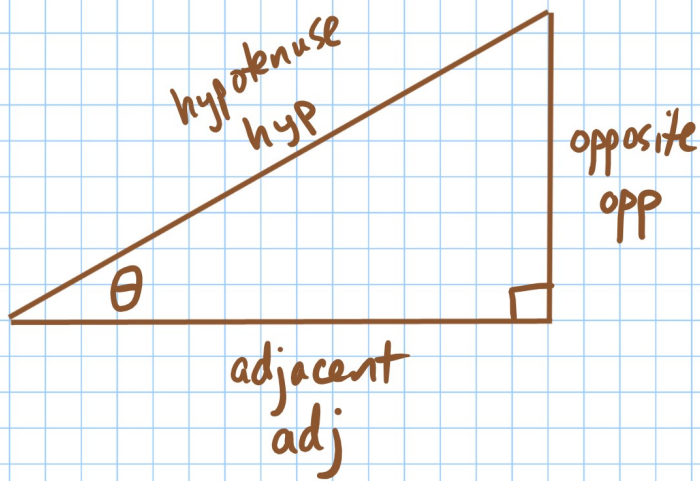


Section 7.1 Right Triangles

To solve a right triangle means to find its missing sides

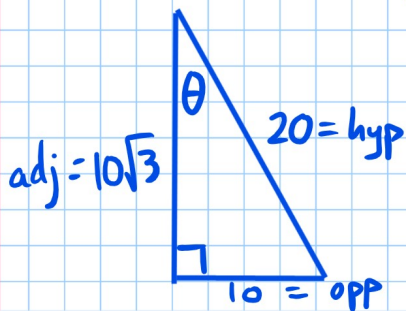


Trig Ratios



$\sin \theta = \frac{\text{opp}}{\text{hyp}}$	} SOH	$\csc \theta = \frac{\text{hyp}}{\text{opp}}$	} CHO
$\cos \theta = \frac{\text{adj}}{\text{hyp}}$		} CAH	
$\tan \theta = \frac{\text{opp}}{\text{adj}}$	} TOA	$\cot \theta = \frac{\text{adj}}{\text{opp}}$	} CAO

ex: Find the 6 trig ratios of θ :



$$\sin \theta = \frac{10}{20} = \frac{1}{2} \quad \csc \theta = \frac{2}{1} = 2$$

$$\cos \theta = \frac{10\sqrt{3}}{20} = \frac{\sqrt{3}}{2} \quad \sec \theta = \frac{2 \cdot \sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$\tan \theta = \frac{10}{10\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \quad \cot \theta = \sqrt{3}$$

$$b^2 + 10^2 = 20^2$$

$$b^2 + 100 = 400$$

$$b^2 = 300$$

$$b = \sqrt{300} = \sqrt{100} \sqrt{3} = 10\sqrt{3}$$

sine and cosine
tangent and cotangent
secant and cosecants

} cofunctions

$$\sin 40^\circ = \cos 50^\circ$$

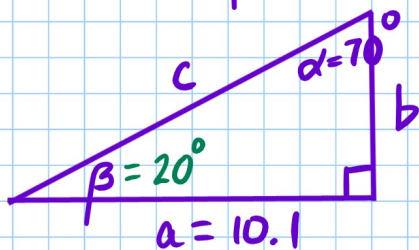
$$\cot 20^\circ = \tan 70^\circ$$

$$\sec 55^\circ = \csc 35^\circ$$

ex: Solve the right triangle that has $\alpha = 70^\circ$ and $a = 10.1$

Step 1:

Draw a picture



Step 2:

What's missing?

$$\beta = \underline{20^\circ}$$
$$c = \underline{10.8}$$
$$b = \underline{3.7}$$

Step 3:

What's easiest?

$$70^\circ + \beta + 90^\circ = 180^\circ$$

$$\beta = 20^\circ$$

Step 4:

Use trig to find another side:

$$\tan 20^\circ = \frac{b}{10.1}$$

$$10.1 \cdot 0.3640 = b$$

$$b = 3.7$$

Step 5:

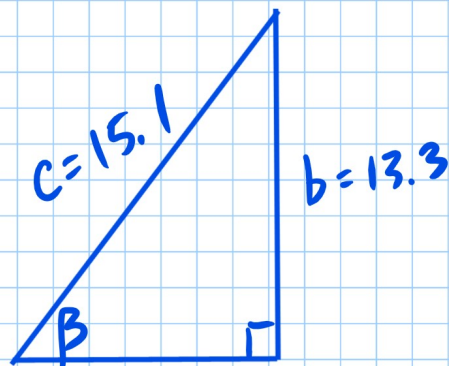
Pythagorean Theorem

$$10.1^2 + 3.7^2 = c^2$$

$$115.7 = c^2$$

$$c = \sqrt{115.7} = 10.8$$

ex: Solve for β



$$\sin \beta = \frac{13.3}{15.1}$$

$$\beta = \sin^{-1} \left(\frac{13.3}{15.1} \right)$$

$$\beta = 61.7^\circ$$

p 536 1, 3, 11, 13, 21, 34