MATH 1080 TRIGONOMETRY Name KEY

7.2 Worksheet – Right Triangle Trig Date

1. Use cofunctions to determine the missing value.

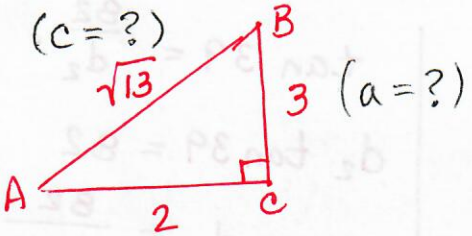
a. $\tan(36°) = \cot($ $90-36$ $)$

$= \cot(54)$

b. $\sin\left(\frac{\pi}{2}\right) = \cos\left(\frac{\pi}{2} - \frac{\pi}{2}\right)$

$= \cos(0)$

2. Given right ΔABC, if $\tan A = \frac{3}{2}$ *and* $b = 5$, *determine the* exact *lengths of sides a and c.*



$2^2 + 3^2 = c^2$

$4 + 9 = c^2$

$13 = c^2$

$\sqrt{13} = c$

$\frac{a}{b} = \frac{a}{b}$

$\frac{3}{2} = \frac{a}{5}$

$15 = 2a$

$7.5 = a$

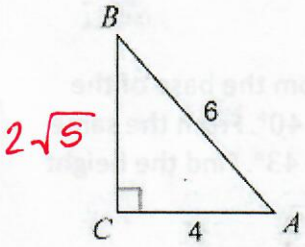
$\frac{c}{b} = \frac{c}{b}$

$\frac{\sqrt{13}}{2} = \frac{c}{5}$

$5\sqrt{13} = 2c$

$\frac{5\sqrt{13}}{2} = c$

3. Given right ΔABC, determine the ***exact*** value of the six trigonometric functions.



$4^2 + a^2 = 6^2$

$16 + a^2 = 36$

$a^2 = 20$

$a = \sqrt{4 \cdot 5}$

$a = 2\sqrt{5}$

$\sin A = \frac{2\sqrt{5}}{6} = \frac{\sqrt{5}}{3}$

$\csc A = \frac{3}{\sqrt{5}}\left(\frac{\sqrt{5}}{\sqrt{5}}\right) = \frac{3\sqrt{5}}{5}$

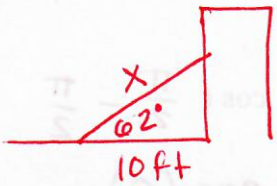
$\cos A = \frac{4}{6} = \frac{2}{3}$

$\sec A = \frac{3}{2}$

$\tan A = \frac{2\sqrt{5}}{4} = \frac{\sqrt{5}}{2}$

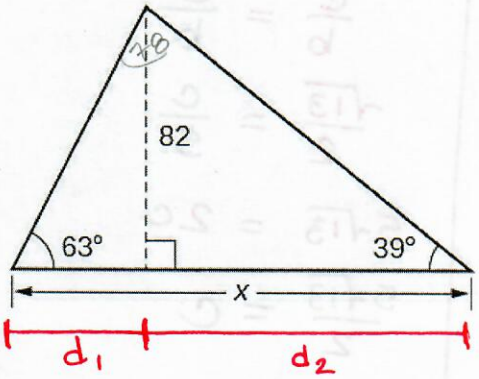
$\cot A = \frac{2}{\sqrt{5}}\left(\frac{\sqrt{5}}{\sqrt{5}}\right) = \frac{2\sqrt{5}}{5}$

4. A ladder leans against a building so that the angle with the ground and the ladder is 62°. If the base of the ladder is about 10 feet from the base of the building, approximate the length of ladder to the nearest tenth of a foot.



$$\cos 62 = \frac{10}{x}$$
$$x \cos 62 = 10$$
$$x = \frac{10}{\cos 62}$$
$$x \approx 21.3 \text{ ft}$$

5. Determine the length of x to the nearest tenth. (Open Stax #42)

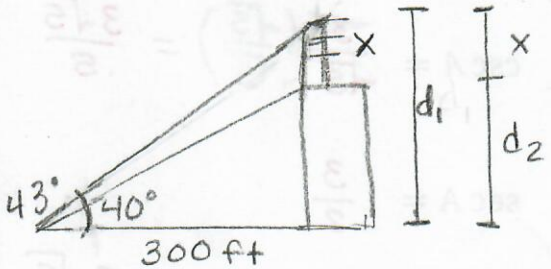


$$\tan 63 = \frac{82}{d_1}$$
$$d_1 \tan 63 = 82$$
$$d_1 = \frac{82}{\tan 63}$$
$$d_1 \approx 41.8$$

$$\tan 39 = \frac{82}{d_2}$$
$$d_2 \tan 39 = 82$$
$$d_2 = \frac{82}{\tan 39}$$
$$d_2 \approx 101.3$$

$$x = d_1 + d_2$$
$$x \approx 41.8 + 101.3$$
$$x \approx 143.1$$

6. There is an antenna on the top of a building. From a location 300 feet from the base of the building, the angle of elevation to the top of the building is measured to be 40°. From the same location, the angle of elevation to the top of the antenna is measured to be 43°. Find the height of the antenna to the nearest hundredth. (Open Stax #50)



Find d_1

$$\tan 43 = \frac{d_1}{300}$$
$$300 \tan 43 = d_1$$
$$279.75 \text{ ft} \approx d_1$$

Find d_2

$$\tan 40 = \frac{d_2}{300}$$
$$300 \tan 40 = d_2$$
$$251.73 \text{ ft} \approx d_2$$

Height of antenna:

$$x = d_1 - d_2$$
$$x \approx 279.75 - 251.73$$
$$x \approx 28.02 \text{ ft}$$