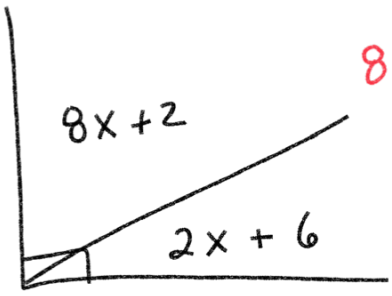
MTH-PT Trigonometry Session 9 2/22

① 

complementary

$8x+2+2x+6=90$

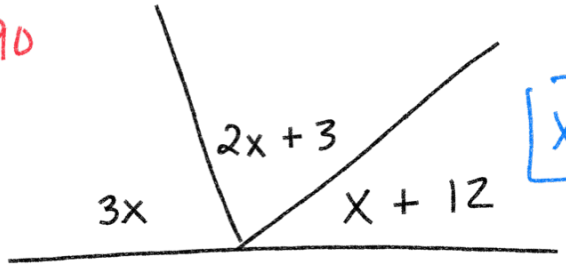
$10x+8=90$

$-8 \quad -8$

$\frac{10x}{10}=\frac{82}{10}$

$x=8.2$

② supplemental



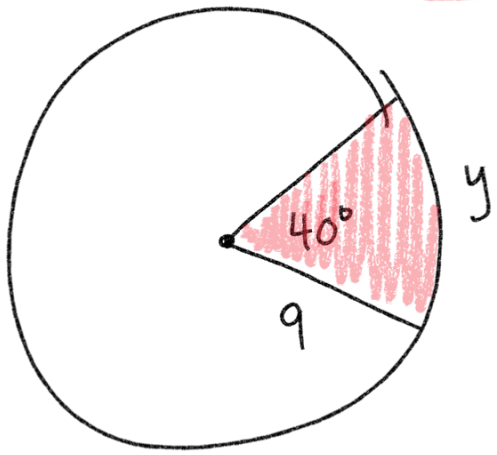
$3x+2x+3+x+12=180$

$6x+15=180$

$-15 \quad -15$

$\frac{6x}{6}=\frac{165}{6}$

$x=27.5$

③ 

Find y and shaded area.

$\frac{\pi r\theta}{180} \cdot \frac{\pi(9)(40)}{180}=\frac{360\pi}{180}=2\pi$

$\frac{40^\circ}{360^\circ}=\frac{y}{2\pi r}$ $\quad \frac{40}{360}=\frac{y}{2\pi(9)}$

$\frac{720\pi}{360}=\frac{360y}{360}$ $\quad y=2\pi$

$\frac{40}{360}=\frac{\text{shaded}}{\pi r^2}$

$\frac{40\pi r^2}{360}=$ shaded area.

$\frac{\pi(9)^2}{9}=9\pi \text{ units}^2$

Degrees → Radians

$315^\circ * \frac{\pi}{180^\circ} = \frac{315\pi}{180} \div 45 = \boxed{\frac{7\pi}{4}}$

$\frac{\pi}{180^\circ}$

Radians → Degrees

$\frac{11\pi}{6} * \frac{180^{30}}{\pi} = \boxed{330^\circ}$

$\frac{180^\circ}{\pi}$

(1) $135^\circ =$ _____ radians

$135^\circ * \frac{\pi}{180^\circ} = \frac{135\pi}{180}$

$\boxed{\frac{3\pi}{4}}$

(2) $\frac{7\pi}{6} =$ _____ $^\circ$

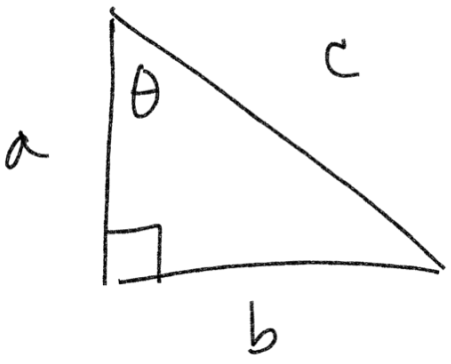
$\frac{7\pi}{6} * \frac{180^{30}}{\pi} = \boxed{210^\circ}$

(3) $\frac{\pi}{6} =$ _____ $^\circ$

$\frac{\pi}{6} * \frac{180^{30}}{\pi} = \boxed{30^\circ}$

(4) $240^\circ =$ _____ radians

$240^{4} * \frac{\pi}{180_{3}} = \boxed{\frac{4\pi}{3}}$



$$\sin\theta = \frac{opp}{hyp} = \frac{b}{c}$$

$$\cos\theta = \frac{adj}{hyp} = \frac{a}{c}$$

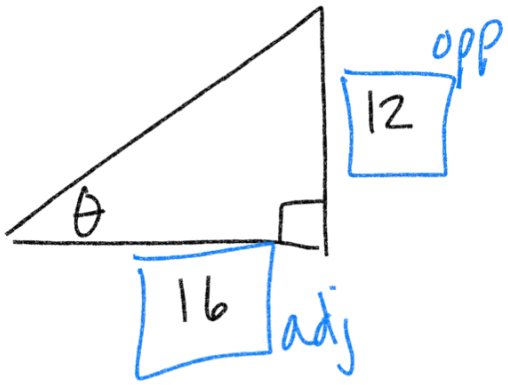
$$\tan\theta = \frac{opp}{adj} = \frac{b}{a}$$

$$\sec\theta = \frac{1}{\cos\theta} = \frac{c}{a}$$

$$\csc\theta = \frac{1}{\sin\theta} = \frac{c}{b}$$

$$\cot\theta = \frac{1}{\tan\theta} = \frac{a}{b}$$

1.)

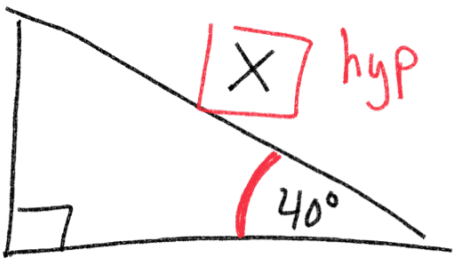


$\tan\theta = \frac{opp}{adj}$

$\tan^{-1}\left(\tan\theta = \frac{12}{16}\right)$

$\theta = \tan^{-1}\left(\frac{12}{16}\right) = 36.9°$

2.)



$\sin\theta = \frac{opp}{hyp}$

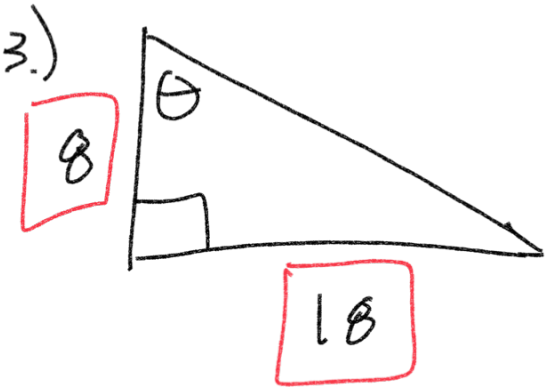
$\sin 40° = \frac{15}{X}$

$X = \frac{15}{\sin 40°} = 23.3$

$4 = \frac{12}{3}$

$3 = \frac{12}{4}$

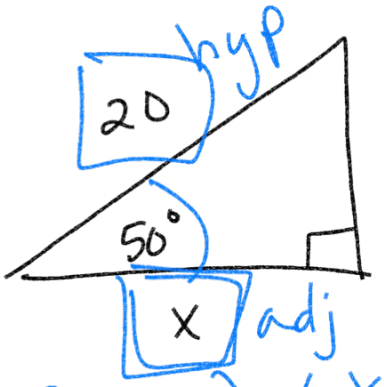
3.)



$\tan\theta = \frac{18}{8}$

$\theta = \tan^{-1}\frac{18}{8} = 66^\circ$

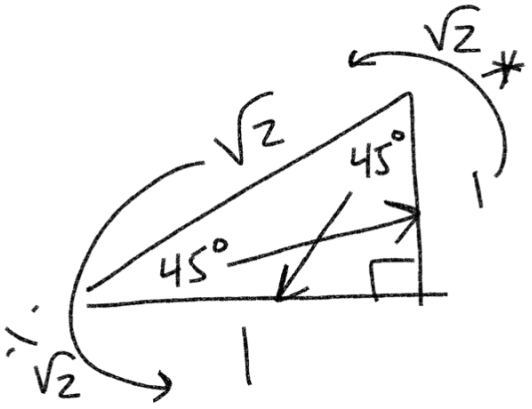
4.)



$20(\cos 50) = \left(\frac{x}{20}\right)20$

$x = 12.9$

Special Triangles



45-45-90 Right Triangle

Isosceles Right

"unit" Circle

radius = 1

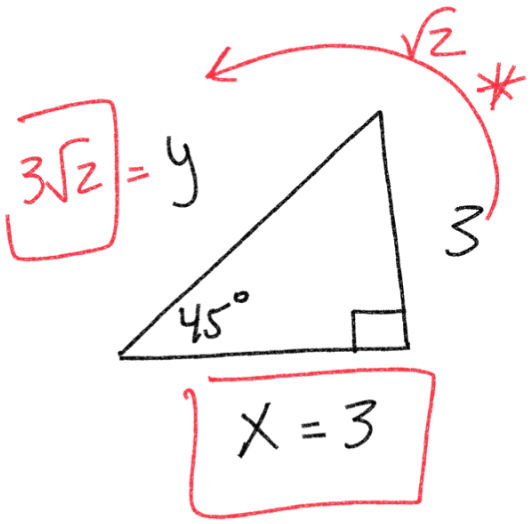
Pythagorean

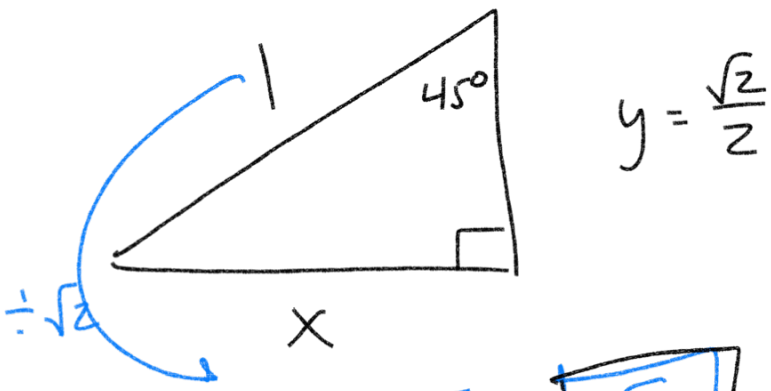
$a^2 + b^2 = c^2$

$(1)^2 + (1)^2 = c^2$

$1 + 1 = c^2$ $\quad c = \sqrt{2}$

$\sqrt{2} = \sqrt{c^2}$

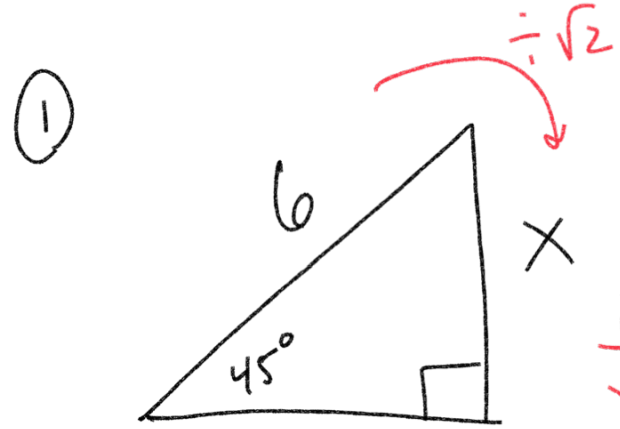




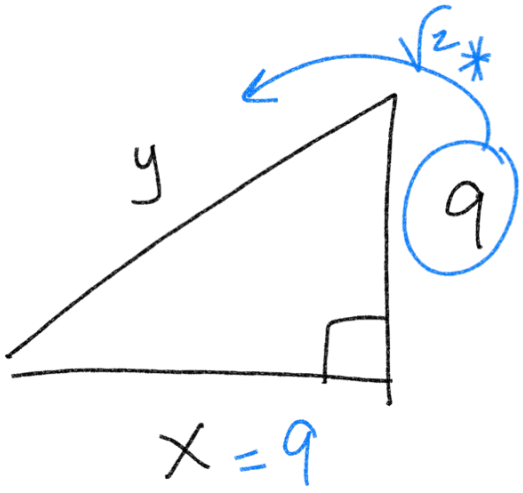
$y = \frac{\sqrt{2}}{2}$

$x = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$2^{\frac{1}{2}} \cdot 2^{\frac{1}{2}} = 2^{\frac{1}{2}+\frac{1}{2}} = 2^1$

① 

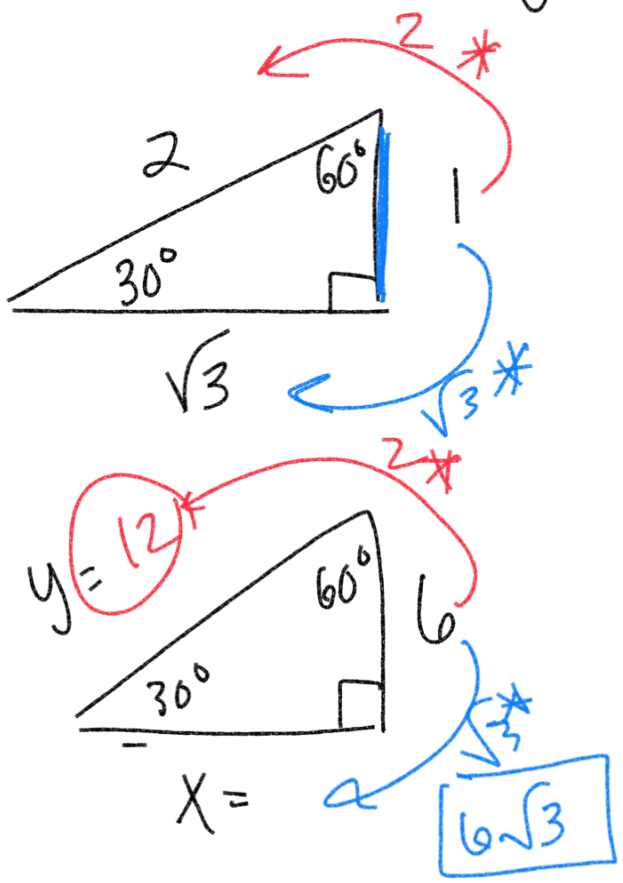
$\frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{2} = 3\sqrt{2}$

② 

$y = 9\sqrt{2}$

$x = 9$

30-60-90 Right Triangle



Pythagorean Theorem

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

$$(1)^2 + b^2 = 2^2$$

$$1 + b^2 = 4$$

$$-1 \qquad -1$$

$$\sqrt{b^2} = \sqrt{3} \qquad b = \sqrt{3}$$