Please follow all instructions on today's check answer sheet:

6.4 CHECK ANSWERS

#4-7→ Use degrees instead of radians: $0° \le \theta < 360°$
NO calculator, sketch triangle in proper quadrant then label angle and sides to justify your solution.

#17-22→ Calculator OK

#29-34→ NO calculator, sketch triangles in Quad I

#39-42→ Calculator OK, sketch diagrams

$\frac{3}{5}$ $\frac{3}{5}$ $\frac{\sqrt{5}}{2}$ $\frac{12}{5}$ $\frac{12}{13}$ $\frac{13}{5}$ $\frac{25}{24}$

0 0 60 90 90 180 135 315 315

19.08 21.25 25.38 27.27 34.70

34.85 36.87 38.66 68.20 72.54

$\theta = \tan^{-1}\frac{50}{5}$ $\theta = \tan^{-1}\frac{h}{2}$ $h = 2\tan\theta$

NOTES: 6.4 Solving for angles using inverses

$\tan^{-1}\left(\sqrt{3}\right)$ indicates you are performing an inverse operation (NOT a reciprocal.) Therefore, it can be rewritten as $\tan\theta = \left(\sqrt{3}\right)$

*Similar idea:

$\sqrt{9}$ indicates an operation.

although it can be rewritten as $x^2 = 9$

NOTES: 6.4 Solving for angles using inverses

Principal values create a unique (one) solution:

$\sin\theta$ and $\tan\theta$ $\rightarrow$ Quadrant I (+)

Quadrant IV (-)

$\cos\theta$ $\rightarrow$ Quadrant I (+)

Quadrant II (-)

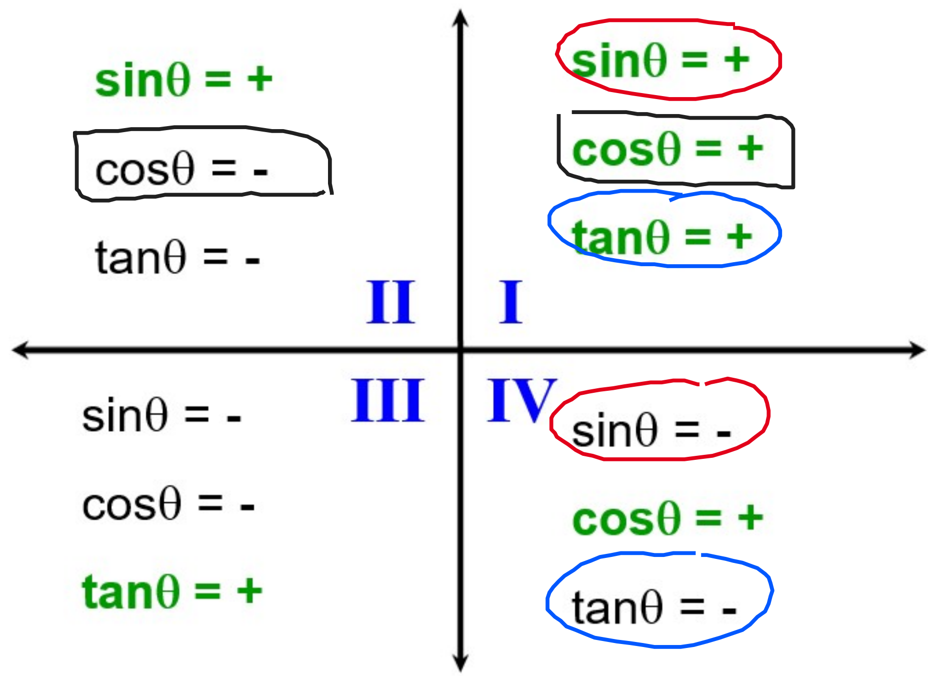
Principal values create a unique (one) solution:

sinθ and tanθ → Quadrant I (+)

Quadrant IV (-)

cosθ → Quadrant I (+)

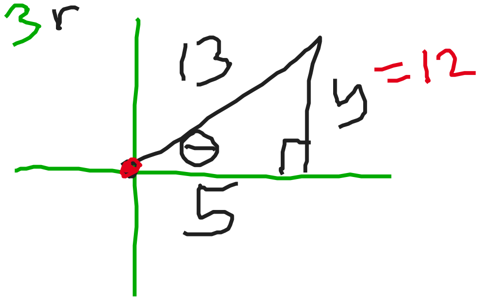
Quadrant II (-)



4. Find $\sin\left(\cos^{-1}\frac{5}{13}\right)$ $\longrightarrow \sin(\theta) = \boxed{\frac{12}{13}}$ $\frac{y}{r}$

let $\theta = \cos^{-1}\frac{5}{13}$

$\cos\theta = \frac{5}{13}\frac{x}{r}$



$5^2 + y^2 = 13^2$

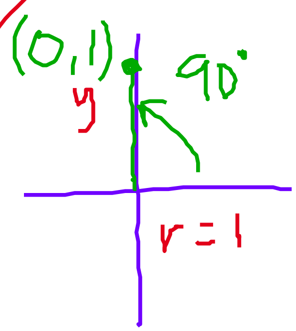
$y = 12$

#5-7: solve for the angle in degrees instead of radians

5. (a) $\sin^{-1} 1$

Quad I or IV

Same as: $\sin\theta = 1$ $\quad \frac{y}{r}$



Therefore: $\sin\theta = 1$

$\theta = 90°$

(b) $\cos^{-1} 0$

(c) $\tan^{-1}\sqrt{3}$

→ $\tan\theta = \sqrt{3}$ $\quad \frac{y}{x}$

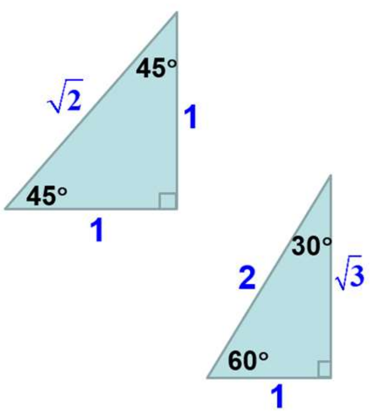
Quad I or IV

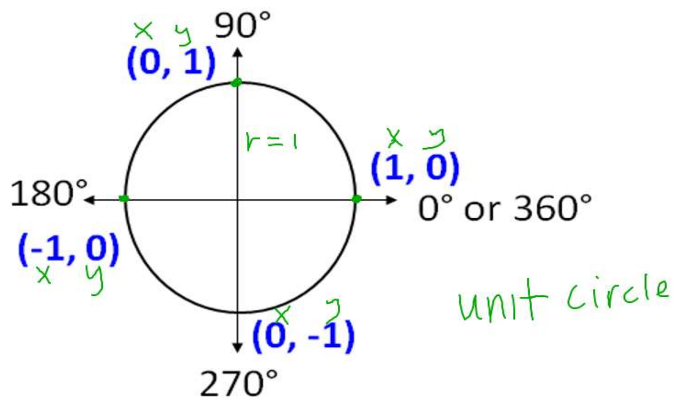
$\sqrt{3}$ is positive

So $\tan\theta = \sqrt{3}$

$\theta = 60°$

USEFUL TOOLS:





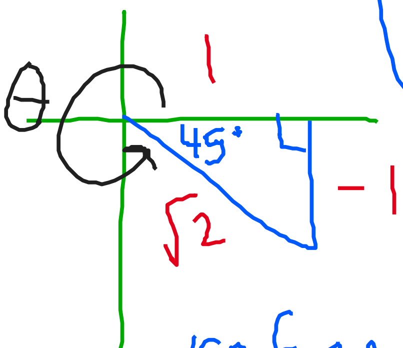
$$\sin\theta = \frac{y}{r} \qquad \csc\theta = \frac{r}{y}$$

$$\cos\theta = \frac{x}{r} \qquad \sec\theta = \frac{r}{x}$$

$$\tan\theta = \frac{y}{x} \qquad \cot\theta = \frac{x}{y}$$

7. (a) $\sin^{-1}\left(-\dfrac{\sqrt{2}}{2}\right)$ Quad I or IV (negative ratio)

$\rightarrow \sin\theta = -\dfrac{\sqrt{2}}{2}$ or $-\dfrac{1}{\sqrt{2}}$ $\dfrac{y}{r}$



$\sin\theta = -\dfrac{\sqrt{2}}{2}$

$\theta = 315°$

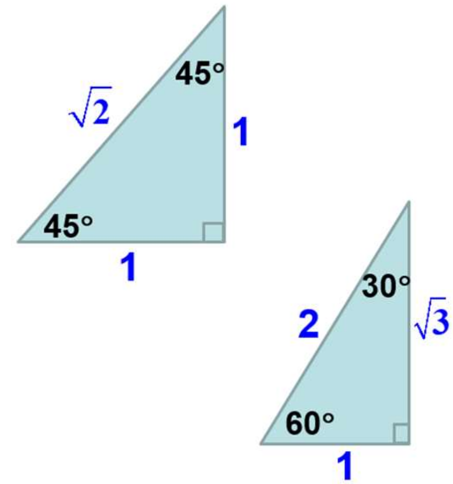
ref angle is 45° ... $\theta = 360 - 45$

Principal values create a unique (one) solution:

sinθ and tanθ → Quadrant I (+)
Quadrant IV (-)

cosθ → Quadrant I (+)
Quadrant II (-)

USEFUL TOOLS:



$\sin\theta = \dfrac{y}{r}$ $\csc\theta = \dfrac{r}{y}$

$\cos\theta = \dfrac{x}{r}$ $\sec\theta = \dfrac{r}{x}$

$\tan\theta = \dfrac{y}{x}$ $\cot\theta = \dfrac{x}{y}$