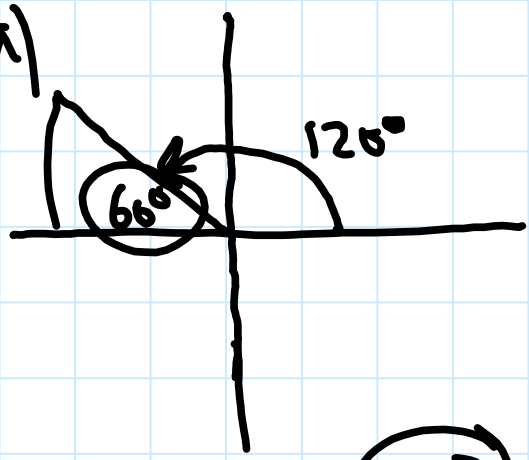
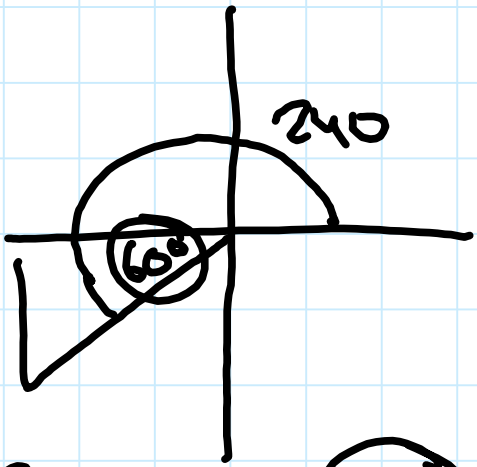
C11 - 2.0 - Q1abcde Trig Review

1a)



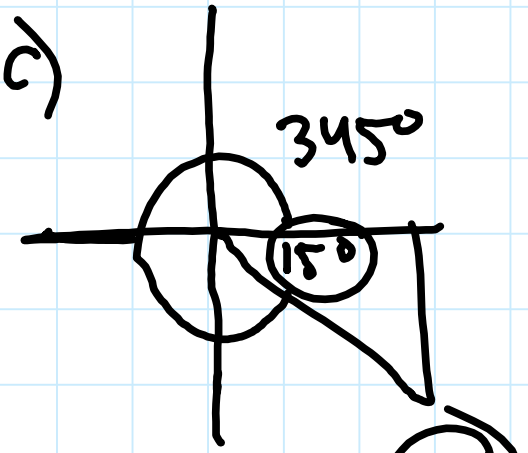
$180 - 120 = 60°$

b)



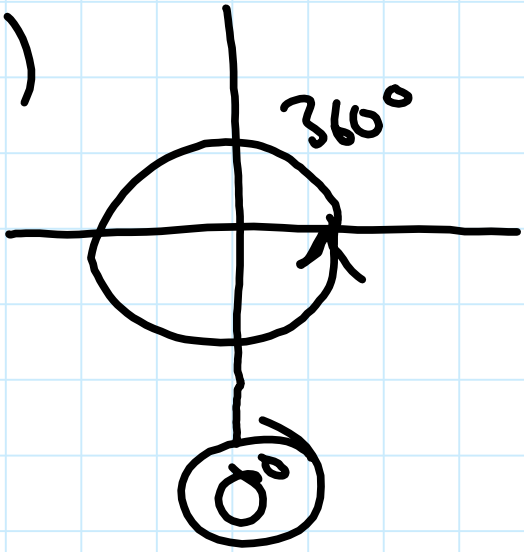
$240 - 180 = 60°$

c)

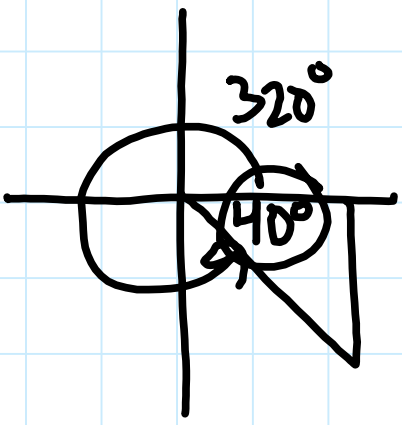


$360 - 345 = 15°$

d)



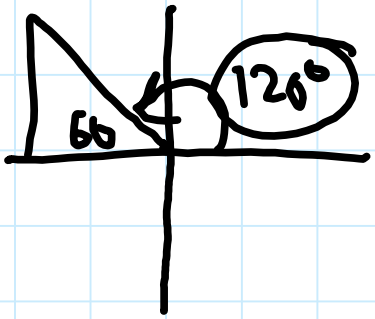
e) $\frac{5000}{360} = 13,\overline{8} - 13 = 0,\overline{8} \times 360 = 320°$



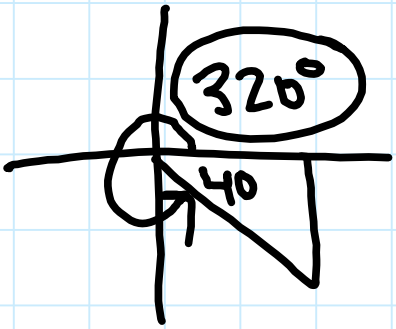
$360 - 320 = 40°$

C11 - 2.0 - Q2abcdef Trig Review

2a)

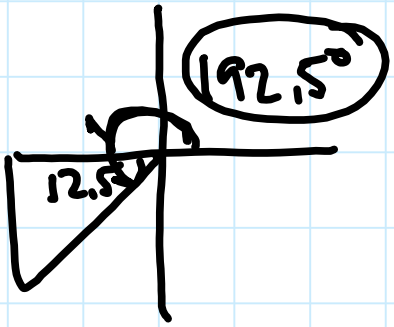


b)

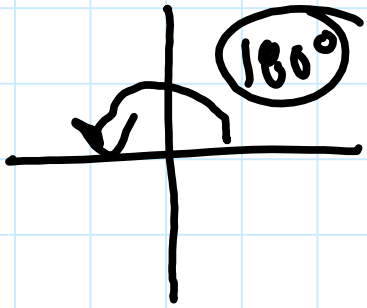


c)

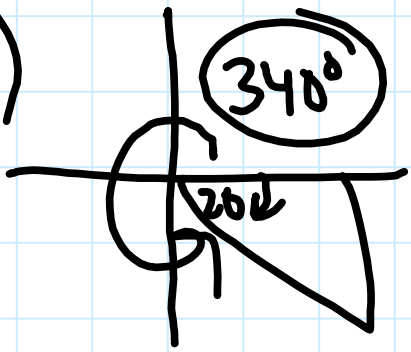
d)



e

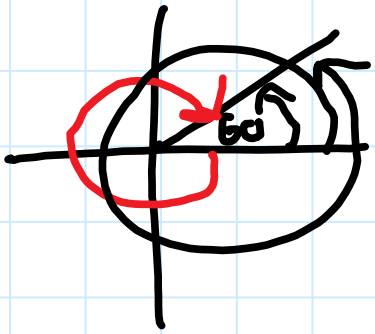


f)



C11 - 2.0 - Q3abcd Trig Review

3a)



$60+360 = 420°$

$60-360 = -300°$

b) $-140+360 = 220°$

$-140-360 = -500°$

c) $180+360 = 540°$

$180-360 = -180°$

d) $2000° + 360 = 2360°$

$\frac{2000}{360} = 5.\overline{5} - 5 = 0.\overline{5} \times 360 = 200°$

$200 - 360 = -160°$

4a) $\theta_{pr.}$ $0 \leq \theta_{pr.} < 360$

$60°$ (60°)

b) $540 - 360° =$ (180°)

c) $1000 - 360 = 641 - 360 =$ (280°)

d) $720° - 360 = 360 - 360 =$ (0°)

e) $\frac{2000}{360} = 5.\overline{5} - 5 = 0.\overline{5} \times 360 =$ (200°)

f) $\frac{10000}{360} = 27.\overline{7} - 27 = 0.\overline{7} \times 360 =$ (280°)

$\theta_{STP}, \theta_r, \theta_{COT}, \theta_{RRI}, \theta_{CEW}$.

C11 - 2.0 - Q5abc Trig Review

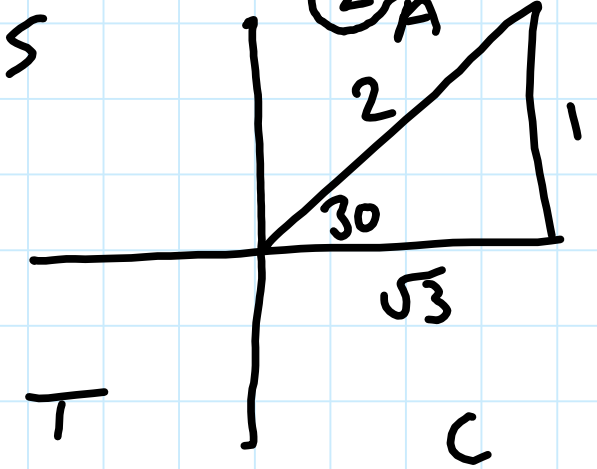
5) a) $\sin 130° = 0.766$

b) $\cos 125° = -0.574$

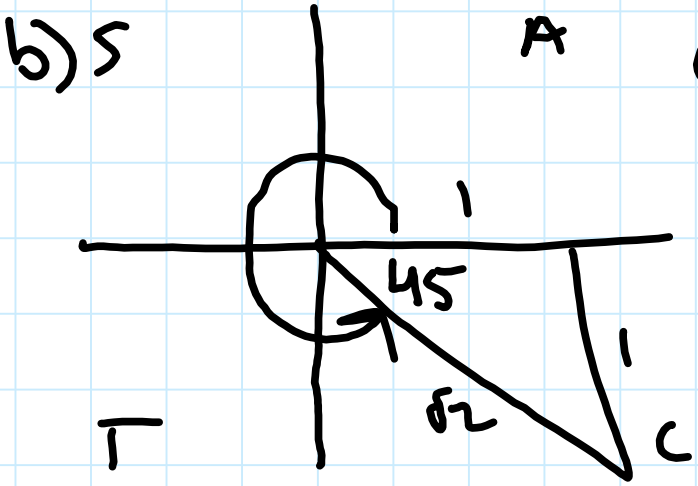
c) $\tan(-34°) = -0.675$

C11 - 2.0 - Q6abc Trig Review

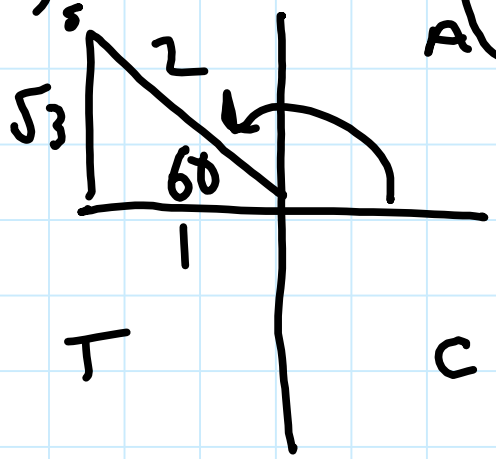
6a) $\sin 30° = \frac{1}{2}$ ✓ $\quad \sin 30 = 0,5$



b) $\cos 315 = +\frac{1}{\sqrt{2}} = 0,707$ ✓

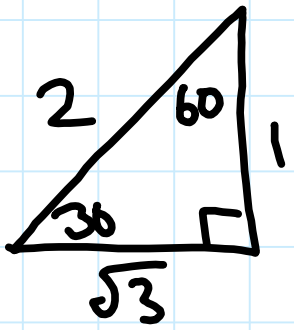


c) $\tan 120° = -\frac{\sqrt{3}}{1}$ ✓ $\quad \tan 120 = -1,73$



7a) $\sin 30 + \cos 60 =$

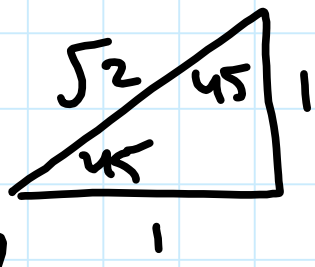
$\frac{1}{2} + \frac{1}{2} = 1$



b) $\cos^2 45$

$\cos 45 \cdot \cos 45$

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

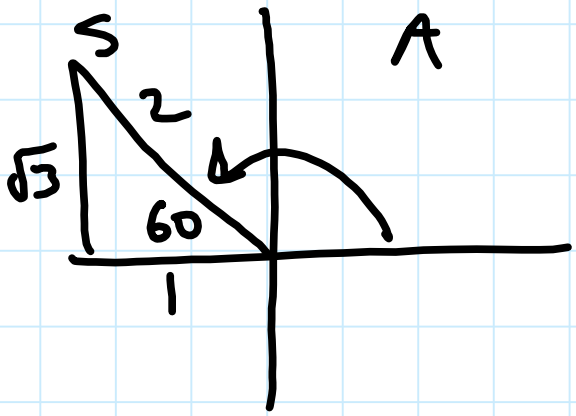


c) $\sin 120 - 2\cos 45$

$+\frac{\sqrt{3}}{2} - 2 \cdot \frac{1}{\sqrt{2}}$

$\frac{\sqrt{2}}{\sqrt{2}} \cdot \frac{\sqrt{3}}{2} - \frac{2}{\sqrt{2}} \cdot \frac{2}{2}$

$\frac{\sqrt{6} - 4}{2\sqrt{2}}$



8a) $\sin\theta = -0.4$

$\theta = \sin^{-1}(+0.4)$

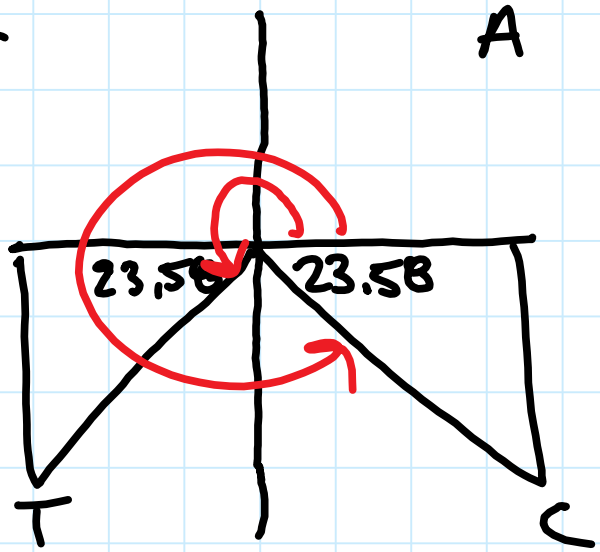
$\theta = 23.58°$

$180 + 23.58$

$203.58°$ ✓

$360 - 23.58$

$336.42°$ ✓



$\sin\theta = -0.4$

$\sin 203.58 = -0.4$ $\sin 336.42 = -0.4$

8b) $5\cos\theta - 3 = 1$

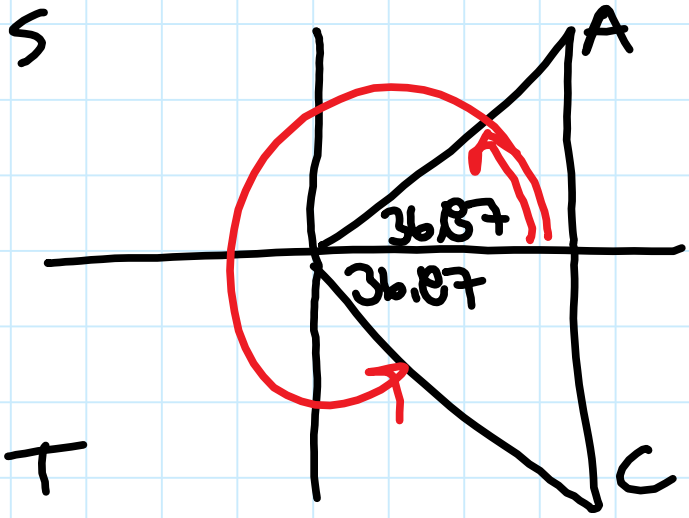
$+3 \quad +3$

$\frac{5\cos\theta}{5} = \frac{4}{5}$

$\cos\theta = \frac{4}{5}$

$\theta = \cos^{-1}\left(\frac{4}{5}\right)$ ✓

$\theta = 36.87$



$360 - 36.87 = 323.13^\circ$ ✓

$5\cos 36.87 - 3 = 1$ $\quad$ $5\cos 323.13 - 3 = 1$

8c) $\sin\theta + \cos\theta = 0$

$-\cos\theta \quad -\cos\theta$

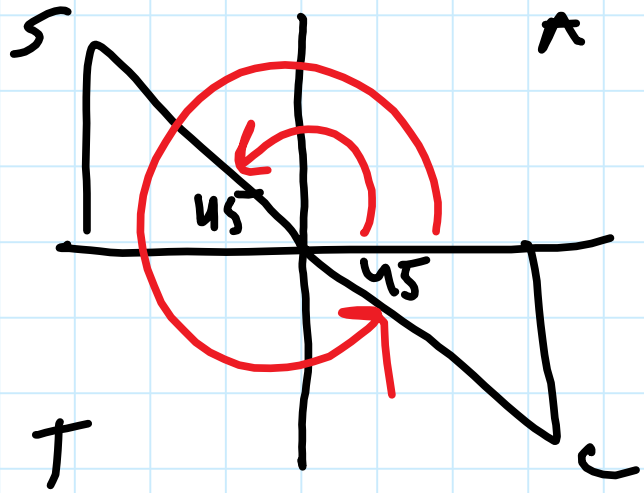
$\frac{\sin\theta}{\cos\theta} = \frac{-\cos\theta}{\cos\theta}$

$\frac{\sin\theta}{\cos\theta} = -1$

$\tan\theta = -1$

$\theta = \tan^{-1}(+1)$

$\tan\theta = \frac{\sin\theta}{\cos\theta}$



$180 - 45 = 135^\circ$ ✓

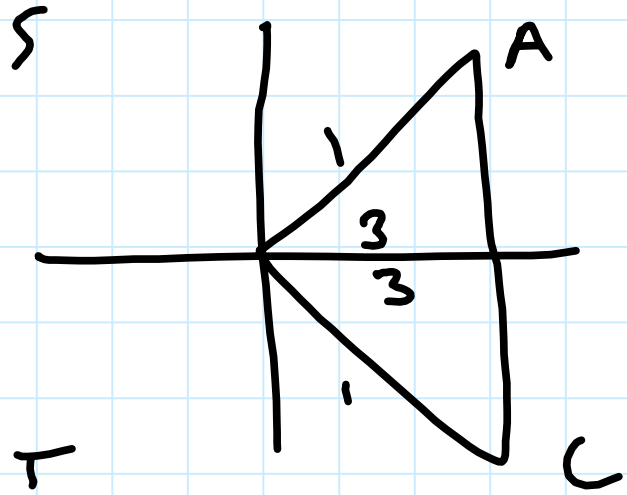
$360 - 45 = 315^\circ$ ✓

$\sin 135 + \cos 135 = 0$ $\quad \sin 315 + \cos 315 = 0$

C11 - 2.0 - Q8d Trig Review

8d) $\cos\theta = \frac{3}{1}$

NO SOLUTION



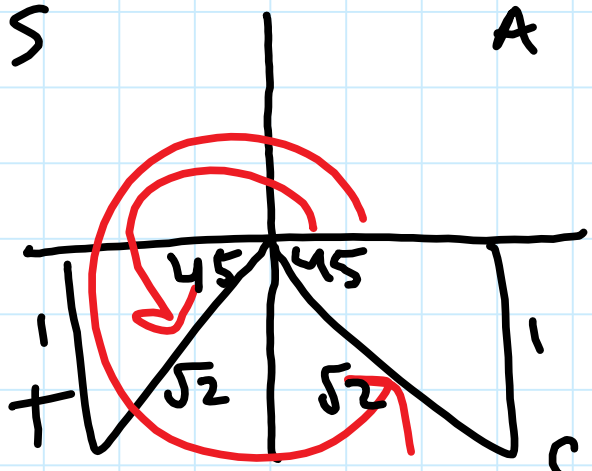
9a) $\sin\theta = -\frac{\sqrt{2}}{2}$

$\sin\theta = -\frac{1}{\sqrt{2}}$

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

$\theta = 225°$ ✓

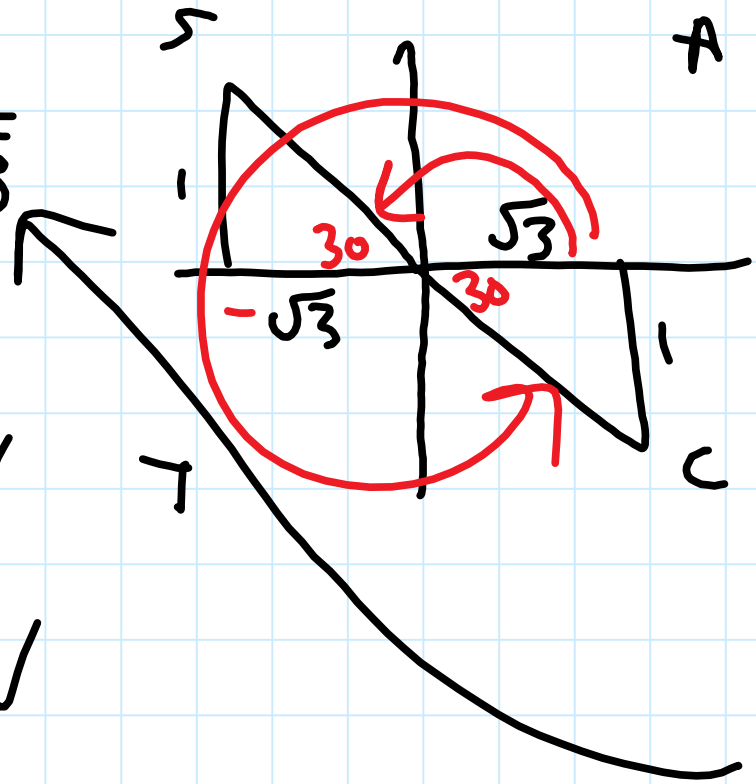
$\theta = 315°$ ✓



$\sin 225 = -.707$ $\sin 315 = -0.707$ $\frac{-1}{\sqrt{2}} = -.707$

9b) $\frac{\sqrt{3}}{\sqrt{3}}\tan\theta = \frac{-1}{\sqrt{3}}$

$\tan\theta = \frac{-1}{\sqrt{3}}$



$\theta = 150°$ ✓

$\theta = 330°$ ✓

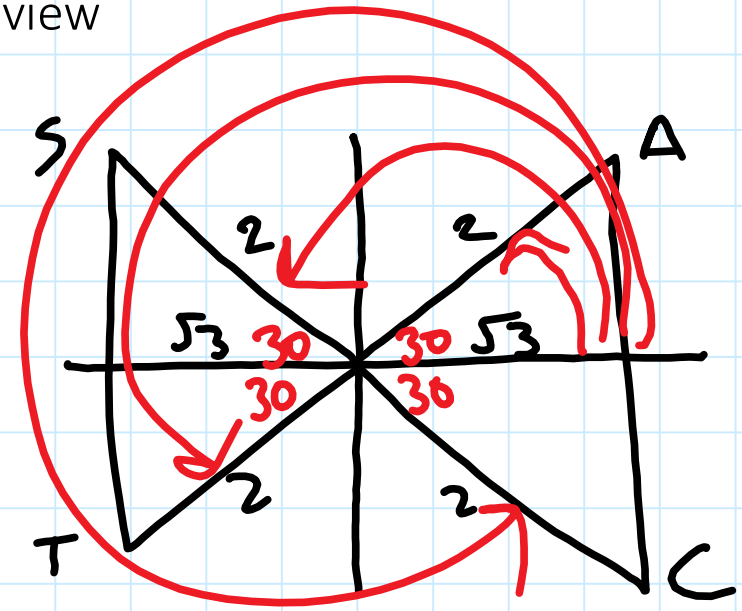
$\tan 150 = -0.577$ $\tan 330 = -0.577$ $\frac{-1}{\sqrt{3}} = -0.577$

C11 - 2.0 - Q9c Trig Review

9c) $\sqrt{\cos^2\theta} = \sqrt{\frac{3}{4}}$

$\cos\theta = \pm\sqrt{\frac{3}{4}}$

$\cos\theta = \pm\frac{\sqrt{3}}{2}$



$\theta = 30°, \theta = 150°, \theta = 210°, \theta = 330°$ ✓

$\cos^2\theta = \cos\theta \cdot \cos\theta$

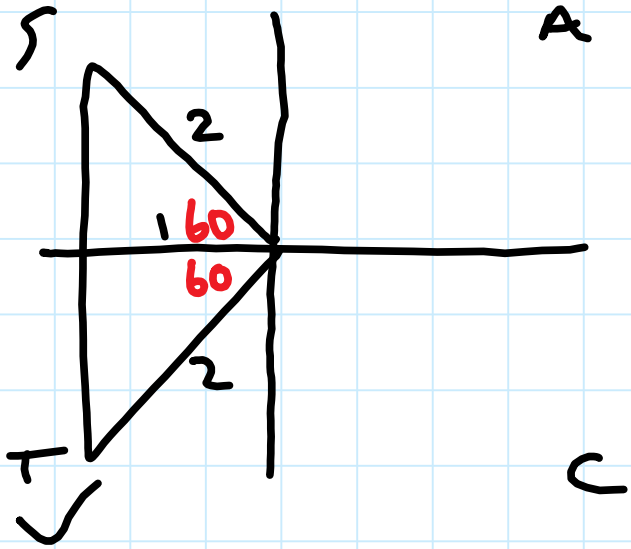
$\cos 30 \cdot \cos 30 = 0.75 = \frac{3}{4}$

$\cos 210 \cdot \cos 210 = 0.75 = \frac{3}{4}$

C11 - 2.0 - Q9de Trig Review

9d) $\sqrt[3]{\cos^3\theta} = \sqrt[3]{-\frac{1}{8}}$

$\cos\theta = -\frac{1}{2}$

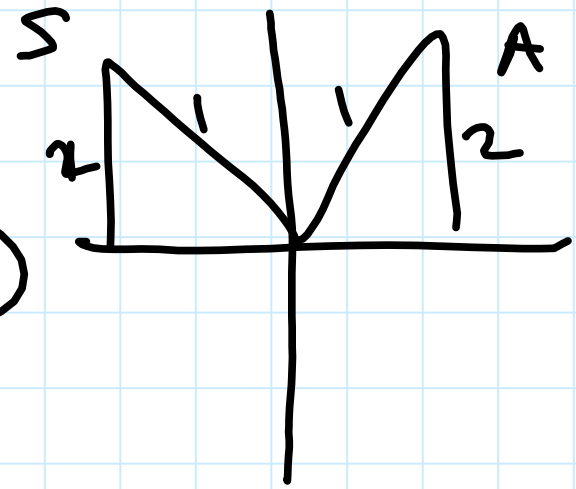


$\theta = 120°, \theta = 240°$

$\cos^3\theta = \cos\theta \cdot \cos\theta \cdot \cos\theta$

$\cos 240 \cdot \cos 240 \cdot \cos 240 = -0.125 = -\frac{1}{8}$

e) $\sin\theta = \frac{2}{1}$



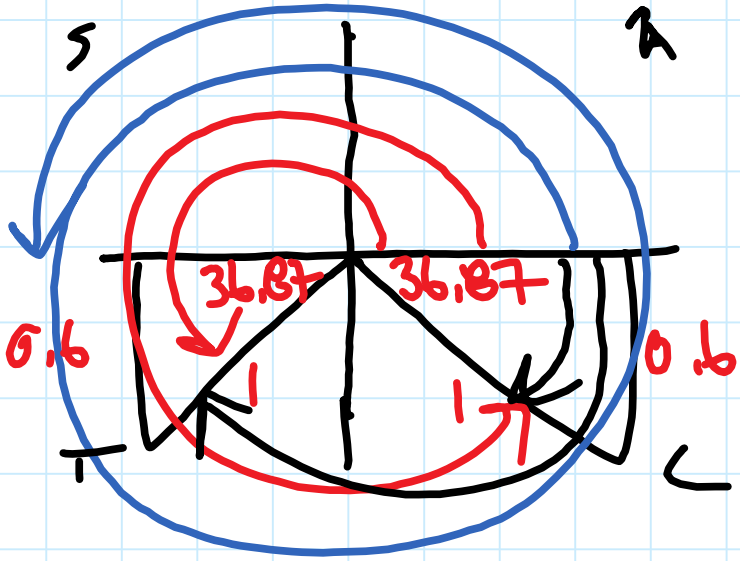
NO SOLUTION.

10a) $\sin\theta = -0.6$

$\theta = \sin^{-1}(+0.6)$

$\theta = 36.87$

$-180 \leq \theta < 540$



$\theta = 180 + 36.87$

$\theta = 216.87$

$\theta = 360 - 36.87$

$\theta = 323.13$

$\theta = -36.87$

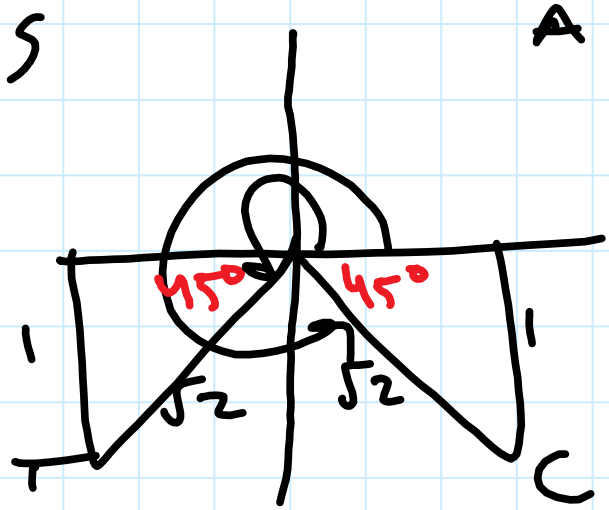
$180 - 36.87$

$\theta = -143.13^\circ$ ✓

$\sin(-143.13) = -0.6$

C11 - 2.0 - Q11a Trig Review

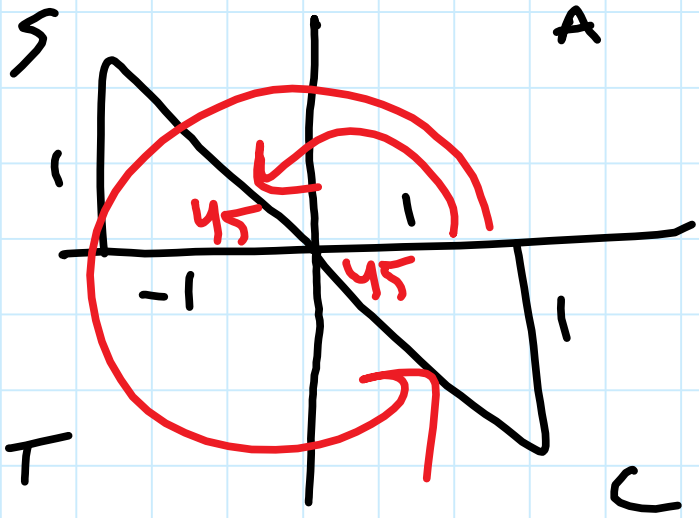
11a) $\sin\theta = -\frac{1}{\sqrt{2}}$



$\theta = 225°$
$\theta = 315°$

$\theta_{gen} = 225 + 360n, n \in I$
$\theta_{gen} = 315 + 360n, n \in I$

11b) $\tan\theta = \frac{-1}{1}$



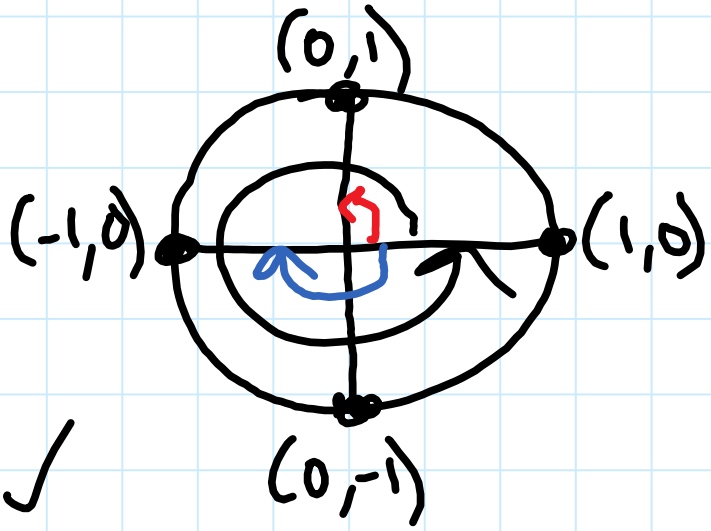
$\theta = 135°$
$\theta = 315°$

$\theta = 135 + 180n, n \in I$
$\theta = 315 + 180n, n \in I$

13

12a) $\sin 90 = 1$ ✓

$\sin\theta = y$ (1)



b) $\cos(-180) = -1$ ✓

$\cos\theta = x$ (2)

c) $\tan 360° = \frac{0}{1} = 0$ ✓

$\tan\theta = \frac{y}{x}$ (3)

d) $\tan 90 = \frac{1}{0} =$ und

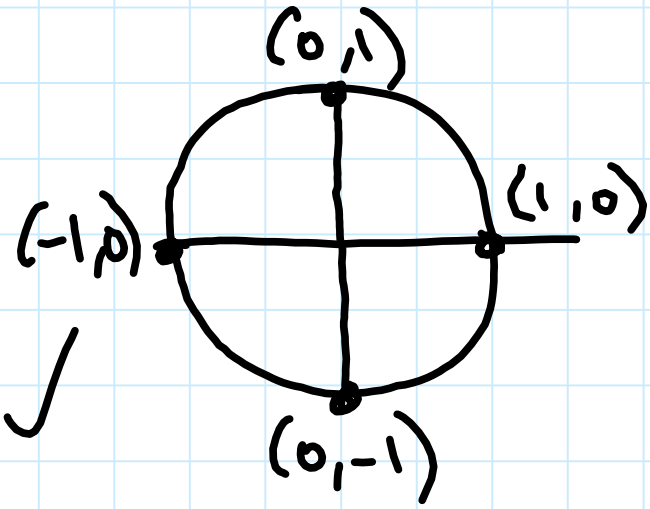
SOHCAHTOA

C11 - 2.0 - Q13abcd Trig Review

13a) $\sin\theta = 0$

$\boxed{\sin\theta = y}$

$\theta = 0°, \theta = 180°$ ✓



b) $\sqrt{\sin^2\theta} = 1$

$\sin\theta = \pm 1$

$\theta = 90°, \theta = 270°$

c) $\cos\theta + 1 = 2$

$-1 \quad -1$

$\cos\theta = 1$ $\quad \theta = 0°$

$\cos\theta = x$

d) $\tan\theta = \text{und}$ $\quad \theta = 90°, \theta = 270°$ ✓

$\tan\theta = \frac{y}{x} \leftarrow 0$

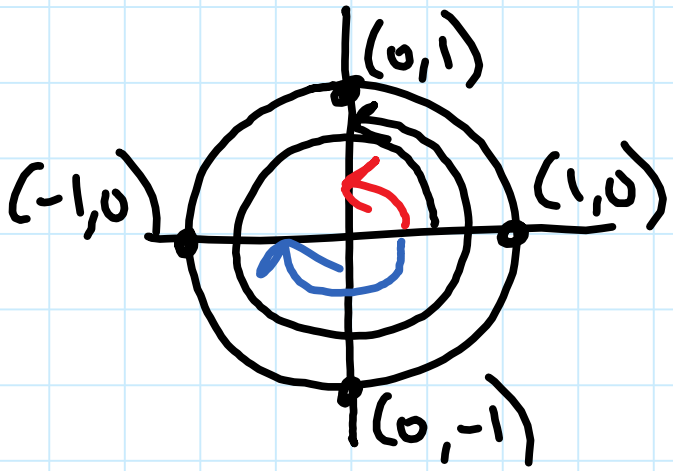
14a) $\sin\theta = 1$

$\sin\theta = y$

$\theta = 90°$ ✓

$\theta = 360 + 90$

$\theta = 450°$ ✓



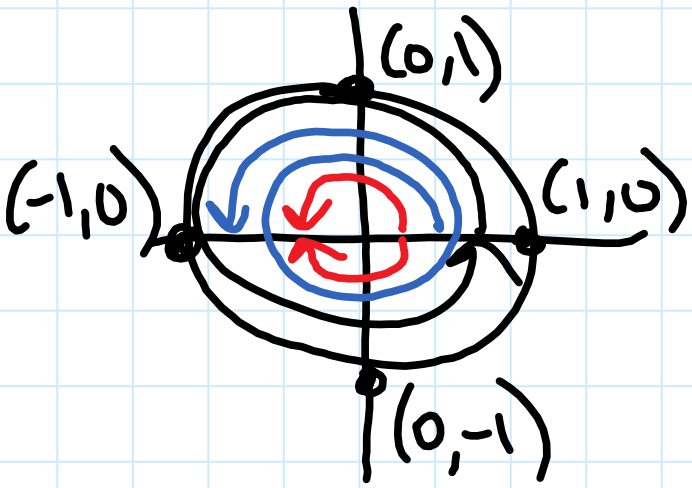
b) $\tan\theta = 0$

$\tan\theta = \frac{y}{x} \leq 0$

$\theta = 0°$

$\theta = 180°$ $\theta = 360°$ $\theta = -180°$

$-180 \leq \theta < 540$



15a) $\sin\theta = -1$

$\theta = 270°$

$\theta_{gen} = 270 + 360n, n \in I$

b) $\tan\theta = \text{und} = \frac{y}{x \to 0}$

$\theta = 90°$ $\theta = 270°$

$\theta_{gen} = 90° + 180n, n \in I$

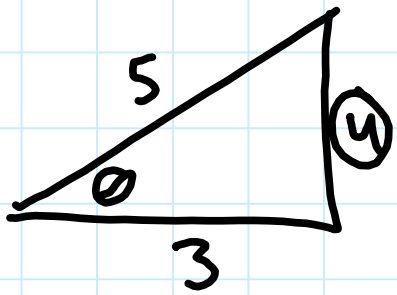
c) $\cos\theta = 0$

$\theta = 90$ $\theta = 270$

$\theta_{gen} = 90 + 360n, n \in I$
$\theta_{gen} = 270 + 360n, n \in I$

C11 - 2.0 - Q16ab Trig Review

16a) $\cos\theta = \frac{3}{5}$ $\sin\theta = \frac{4}{5}$



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

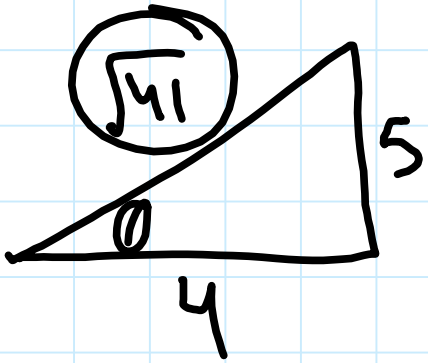
$3^2 + b^2 = 5^2$

$9 + b^2 = 25$

$\sqrt{b^2} = \sqrt{16}$

$b = 4$

b) $\tan\theta = 1\frac{1}{4} = \frac{5}{4}$ $\cos\theta = \frac{4}{\sqrt{41}}$



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

$4^2 + 5^2 = c^2$

$\sqrt{41} = \sqrt{c^2}$

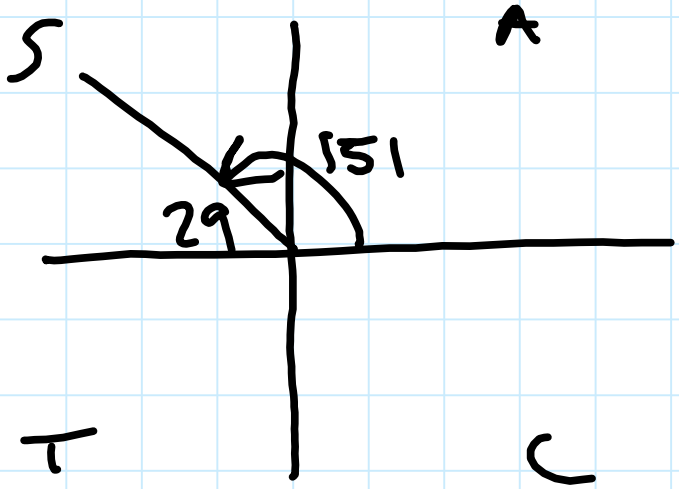
$c = \sqrt{41}$

17a) $\sin 151 = \sin \theta$

$\theta = 29°$

$\sin 151 = 0.4848$

$\sin 29° = 0.4848$

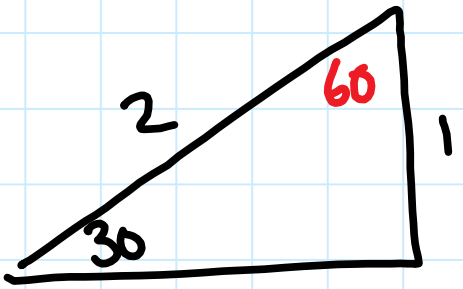


C11 - 2.0 - Q18ab Trig Review

(Ba) $\sin 30^\circ = \cos x^\circ$

$\frac{1}{2} = \cos 60$

$x = 60^\circ$



$\sin\theta = \cos(90-\theta)$

b) $\cos 0^\circ = \sin x^\circ$

$90 - 0 = 90$

$\cos 0^\circ = \sin 90^\circ$ $x = 90^\circ$ ✓

$\cos 0^\circ = \sin 90^\circ$

$1 = 1$

19a) $\sin 2\theta = 0$ let $m = 2\theta$ $\sin\theta = y$

$\sin m = 0$

$m = 0°$	$m = 180°$	$m = 360°$	$m = 540°$	$m = 720°$
$2\theta = 0°$	$2\theta = 180°$	$2\theta = 360°$	$2\theta = 540°$	$2\theta = 720°$
$\theta = 0°$	$\theta = 90°$	$\theta = 180°$	$\theta = 270°$	~~$\theta = 360$~~

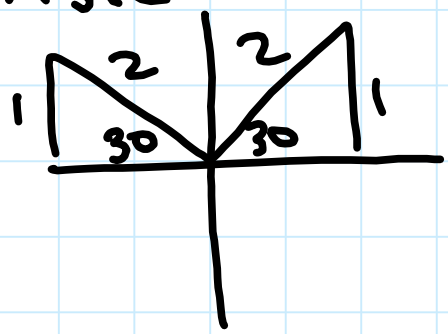
$\theta_{gen} = \cancel{0} + 90n, n \in I$

$\theta_{gen} = 90n, n \in I$

19)b) $\sin 2\theta = \frac{1}{2}$ let $m = 2\theta$

$\sin m = \frac{1}{2}$

ASTC



$m = 30°$ $m = 150°$

$\frac{2\theta}{2} = \frac{30°}{2}$ $\frac{2\theta}{2} = \frac{150°}{2}$

$\theta = 15°$ $\theta = 75°$

$15° + 180 = 195°$

$195 + 180 = 375$

$75° + 180 = 255°$

$\theta = 15 + 180n, n \in I$

$\theta = 75 + 180n, n \in I$

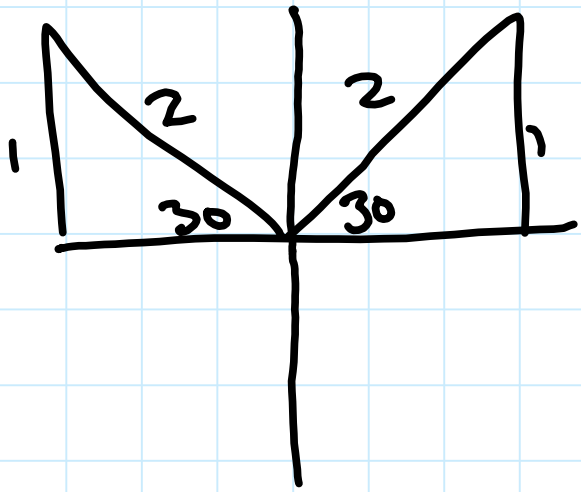
$\sin b\theta$

$p = \frac{360}{2} = 180°$

20a) $\sin\theta + \sin\theta = 1$

$\frac{2\sin\theta}{2} = \frac{1}{2}$

$\sin\theta = \frac{1}{2}$



$\theta = 30°, \theta = 150°$

b) $1 + 6\cos\theta = 2\cos\theta + 9$

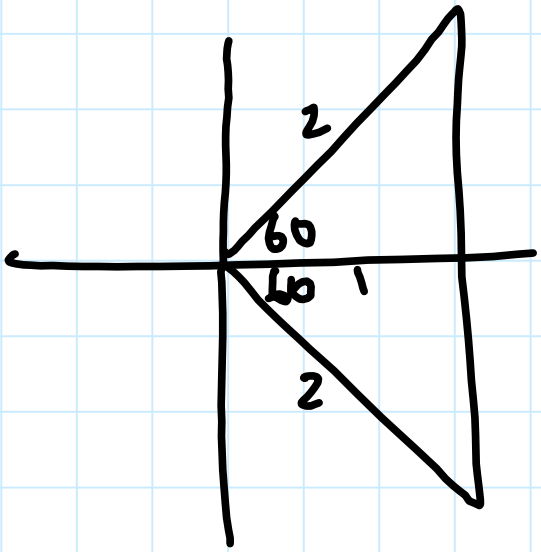
$-1 \qquad\qquad -1$

$6\cos\theta = 2\cos\theta + 8$

$-2\cos\theta \quad -2\cos\theta$

$\frac{4\cos\theta}{4} = \frac{8}{4}$

$\cos\theta = \frac{1}{2}$



$\theta = 60°$ $\theta = 300°$

20c) $\frac{\tan\theta}{\tan\theta+1} = -2$ let $\tan\theta = m$

$(m+1)\frac{m}{m+1} = -2(m+1)$

$m = -2m - 2$

$+2m \quad +2m$

$\frac{3m}{3} = \frac{-2}{3}$

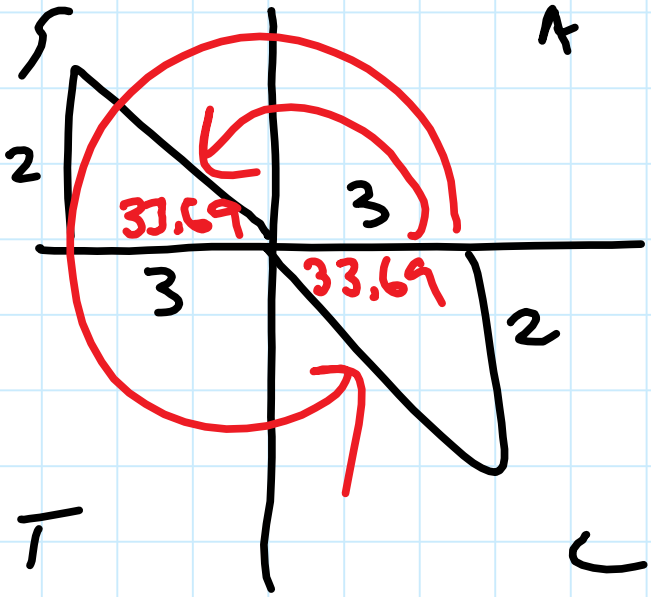
$m = \frac{-2}{3}$

$\tan\theta = \frac{-2}{3}$

$\theta = \tan^{-1}\left(\pm\frac{2}{3}\right)$

$\theta = 33.69$

$\theta = 146.31°$ $\theta = 326.31°$



21a) $\sin\theta + \sin\theta\cos\theta = 0$

$\sin\theta(1+\cos\theta) = 0$

$\sin\theta = 0$ ●●●

$1+\cos\theta = 0$

$-1 \quad -1$

$\cos\theta = -1$ ●●●

b) $\sin^2\theta + \sin\theta - 2 = 0$ let $m = \sin\theta$

$m^2 + m - 2 = 0$

$(m+2)(m-1) = 0$

$m+2 = 0 \quad m-1 = 0$

$m = -2 \quad m = 1$

~~$\sin\theta = -2$~~ $\sin\theta = 1$ ●●●

21c) $2\sin^2\theta + \sin\theta - 1 = 0$ let $m = \sin\theta$

$2m^2 + m - 1 = 0$

$\frac{2}{2} \times \frac{-1}{+1} = -2$

$\frac{2}{2} + \frac{-1}{+1} = +1$

$(2m^2 + 2m)(-m - 1) = 0$

$2m(m+1) - 1(m+1) = 0$

$(2m-1)(m+1) = 0$

$2m - 1 = 0$ $\quad m + 1 = 0$

$m = \frac{1}{2}$ $\quad m = -1$

$\sin\theta = \frac{1}{2}$ $\quad \sin\theta = -1$

●●● ●●●

21d) $3\cos^2\theta - 8\cos\theta - 5 = 0$

$3m^2 - 8m - 5 = 0$

$m = \cos\theta$

$3 \times 5 = -15$

$3 + 5 = -8$

QUAD FORM

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{8 \pm \sqrt{64 + 60}}{6}$$

$m = 3.18$ ~~$\cos\theta = 5.18$~~

$m = -0.522$ $\cos\theta = -0.522$

22a) $\frac{1}{\sin\theta}$ $\quad \sin\theta \neq 0$

$\theta \neq 0, 180°$

b) $\frac{1}{\tan\theta}$ $\quad \tan\theta = \frac{\sin\theta}{\cos\theta}$

$\frac{1}{\frac{\sin\theta}{\cos\theta}}$ $\quad \sin\theta \neq 0$ $\quad \cos\theta \neq 0$

$\theta \neq 0, 180°$ $\quad \theta \neq 90, 270°$

c) $\frac{1}{\cos\theta + 1}$ $\quad \cos\theta + 1 \neq 0$

$\cos\theta \neq -1$

$\theta \neq 180°$

d) $\frac{1}{\cos^2 x - 1}$ $\quad \cos^2 x - 1 \neq 0$

$\cos^2 x \neq 1$

$\cos x \neq \pm 1$

$x \neq 0, 180°$

e) $\frac{1}{\sin^2\theta + 1}$ $\quad \sin^2\theta + 1 \neq 0$

$\sin^2\theta \neq -1$

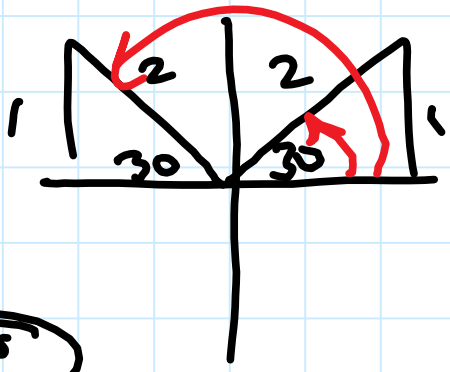
NO RESTRICTIONS

22f) $\frac{1}{\sin\theta - \frac{1}{2}}$

$\sin\theta - \frac{1}{2} \neq 0$

$\sin\theta \neq \frac{1}{2}$

$\theta \neq 30°, 150°$

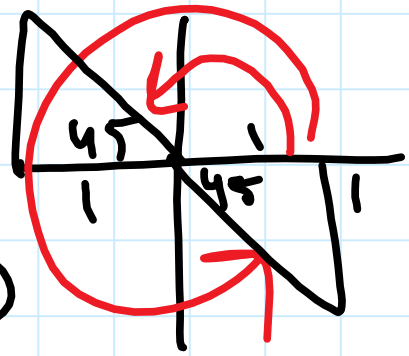


g) $\frac{1}{\tan\theta + 1}$

$\tan\theta + 1 \neq 0$

$\tan\theta \neq -1$

$\theta \neq 135°, 315°$



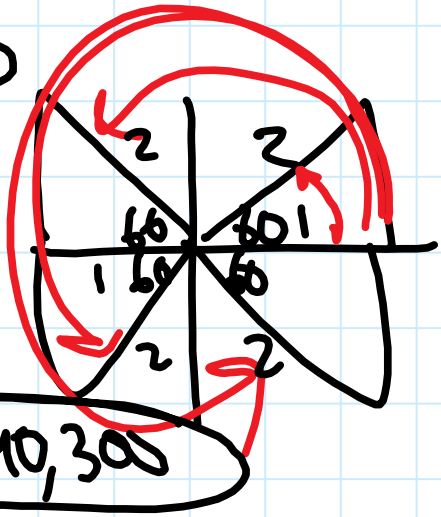
h) $\frac{1}{4\cos^2\theta - 1}$

$4\cos^2\theta - 1 \neq 0$

$\sqrt{\cos^2\theta} \neq \sqrt{\frac{1}{4}}$

$\cos\theta \neq \pm\frac{1}{2}$

$\theta \neq 60, 120, 240, 300$



23a) $\left(\frac{1}{4}, \frac{\sqrt{15}}{4}\right)$

$x^2 + y^2 = 1$

$\left(\frac{1}{4}\right)^2 + \left(\frac{\sqrt{15}}{4}\right)^2 = 1$

$\frac{1}{16} + \frac{15}{16} = 1$

$\frac{16}{16} = 1$ ✓

b) $\left(\frac{1}{2}, \frac{1}{2}\right)$

$x^2 + y^2 = 1$

$\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2 \neq 1$

$\frac{1}{4} + \frac{1}{4} \neq 1$

$\frac{2}{4} \neq 1$ ✗

c) $(0,1)$ YES.

24a) $\left(\frac{1}{4}, y\right)$ Q1

$x^2+y^2=1$

$\left(\frac{1}{4}\right)^2+y^2=1$

$\frac{1}{16}+y^2=1$

$-\frac{1}{16}\quad -\frac{1}{16}$

$-\frac{1}{16}$

$16\times\frac{1}{1}-\frac{1}{16}$

6×1

$\frac{16}{16}-\frac{1}{16}=\frac{15}{16}$

$y^2=1-\frac{1}{16}$

$\sqrt{y^2}=\sqrt{\frac{15}{16}}$

$y=\pm\frac{\sqrt{15}}{4}=\left(\frac{\sqrt{15}}{4}\right)$

$\left(\frac{1}{4}, \frac{\sqrt{15}}{4}\right)$

b) $\left(x, \frac{1}{2}\right)$ Q11

$\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$x^2+y^2=1$

$x^2+\left(\frac{1}{2}\right)^2=1$

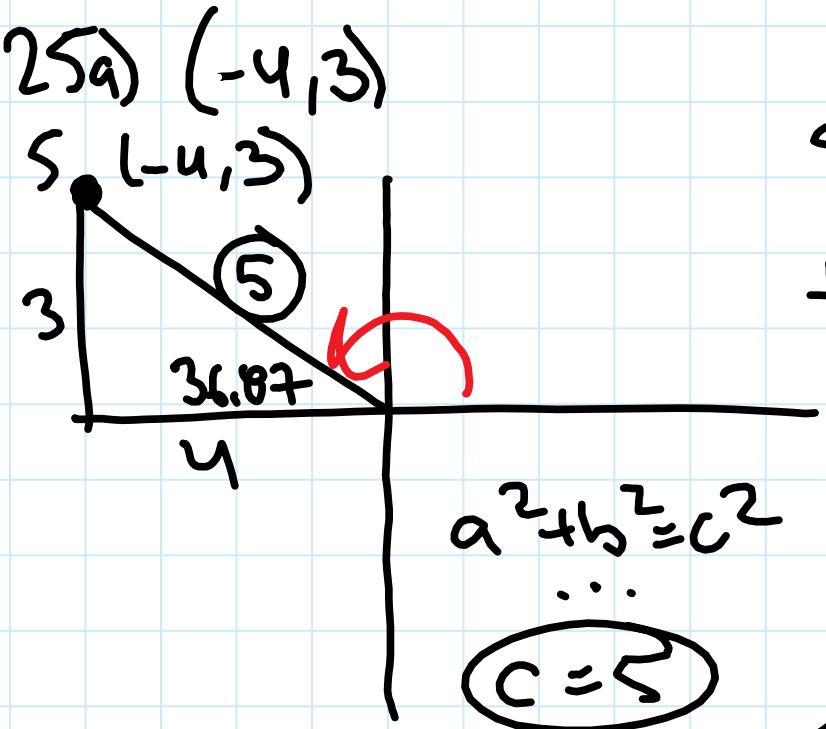
$x^2+\frac{1}{4}=1-\frac{1}{4}$

$\sqrt{x^2}=\sqrt{\frac{3}{4}}$

$x=\pm\frac{\sqrt{3}}{2}=\left(-\frac{\sqrt{3}}{2}\right)$

C11 - 2.0 - Q25a Trig Review

25a) $(-4,3)$



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

$\dots$

$c=5$

$\sin\theta = +\frac{3}{5}$

$\tan\theta = -\frac{3}{4}$

$\cos\theta = -\frac{4}{5}$

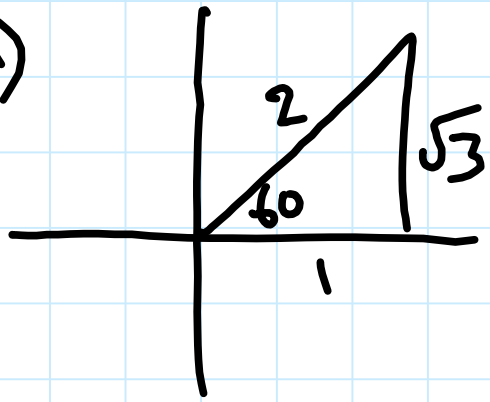
$\theta = \cos^{-1}\left(+\frac{4}{5}\right)$

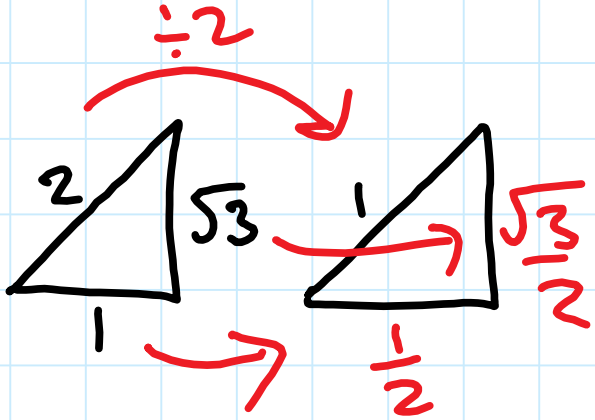
$\theta = 36.87°$

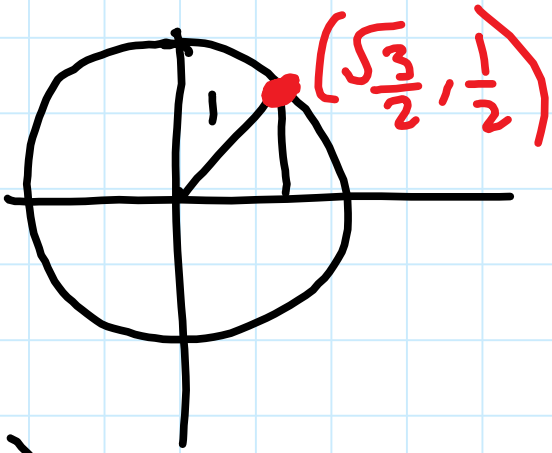
$\emptyset = 143.13°$

C11 - 2.0 - Q26abc Trig Review

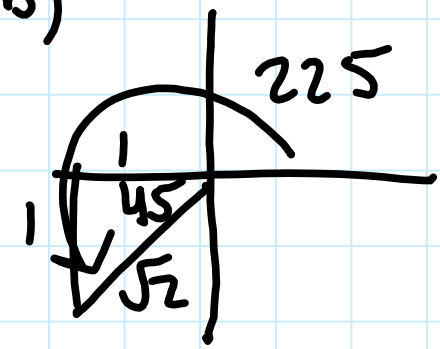
26a)

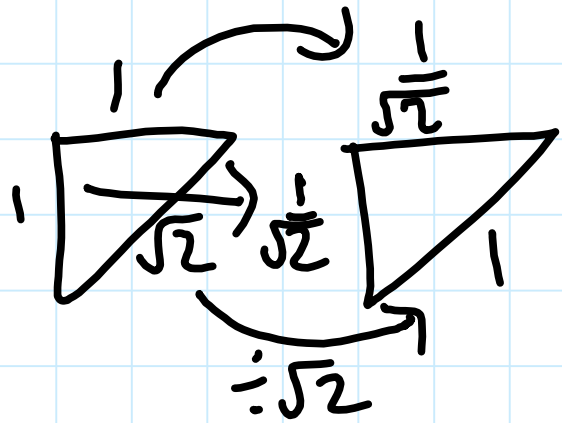


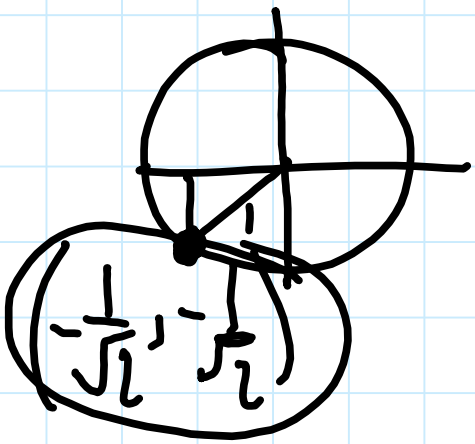


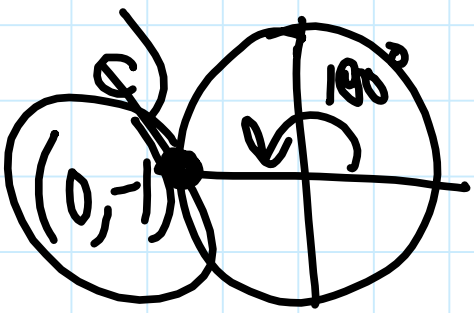


b)

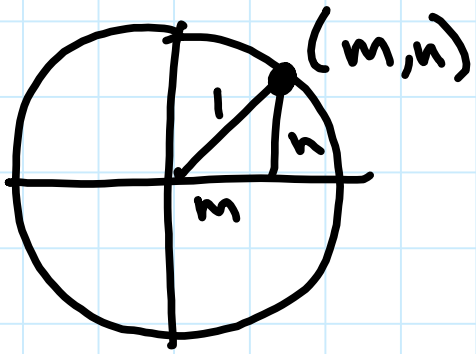








27) (m,n) Q I

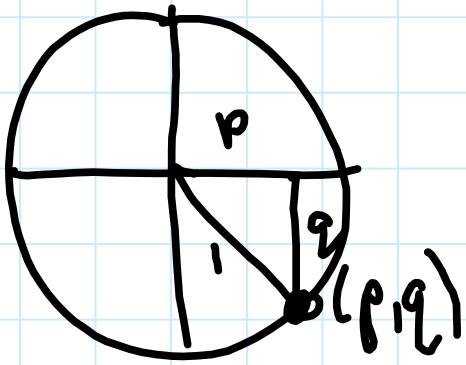


$\sin\theta = \frac{n}{1}$

$\cos\theta = \frac{m}{1}$

$\tan\theta = \frac{n}{m}$

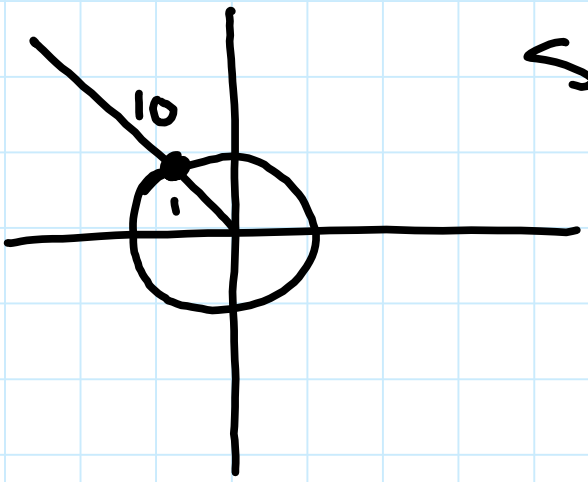
28) (p,q) Q IV



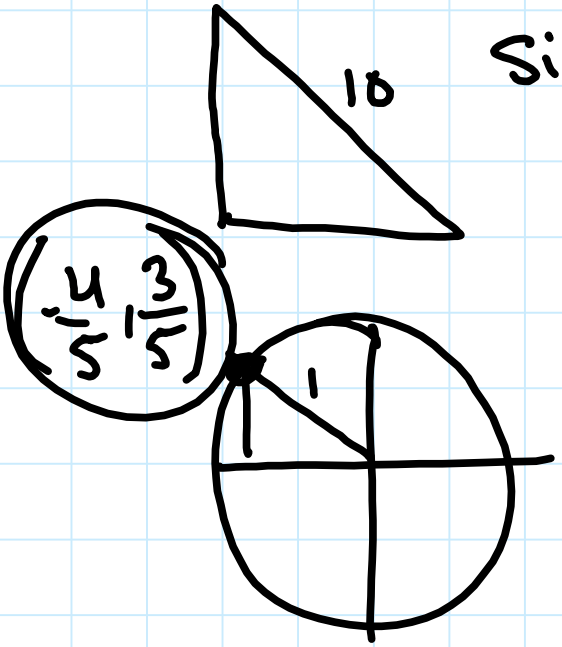
$\cos\theta = \frac{p}{1}$

$\sin\theta = \frac{q}{1}$

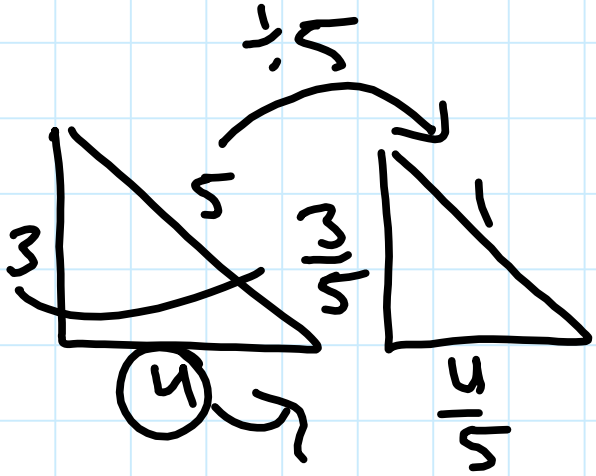
29)



$\sin\theta = \frac{3}{5}$



$\sin\theta = \frac{3}{5}$



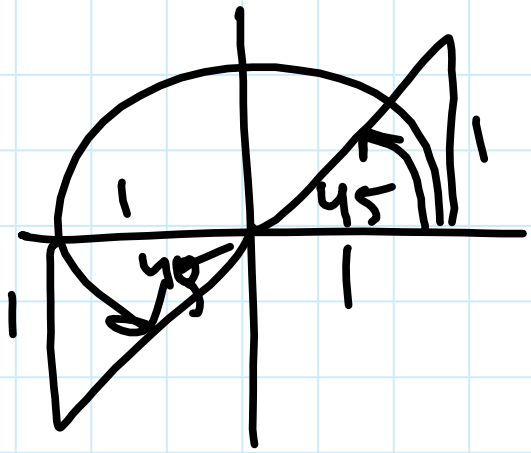
$a^2 + b^2 = c^2$

$\dots$

$c = 4$

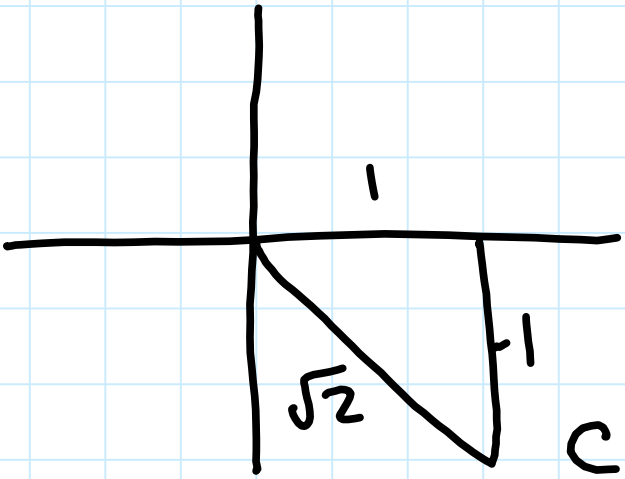
30) $\frac{\sin\theta}{\cos\theta} = \frac{\cos\theta}{\cos\theta}$

$\tan\theta = \frac{1}{1}$



$\theta = 45, 225°$

31) $\sin\theta = \frac{-1}{\sqrt{2}}$ Q4



$\cos\theta = +\frac{1}{\sqrt{2}}$

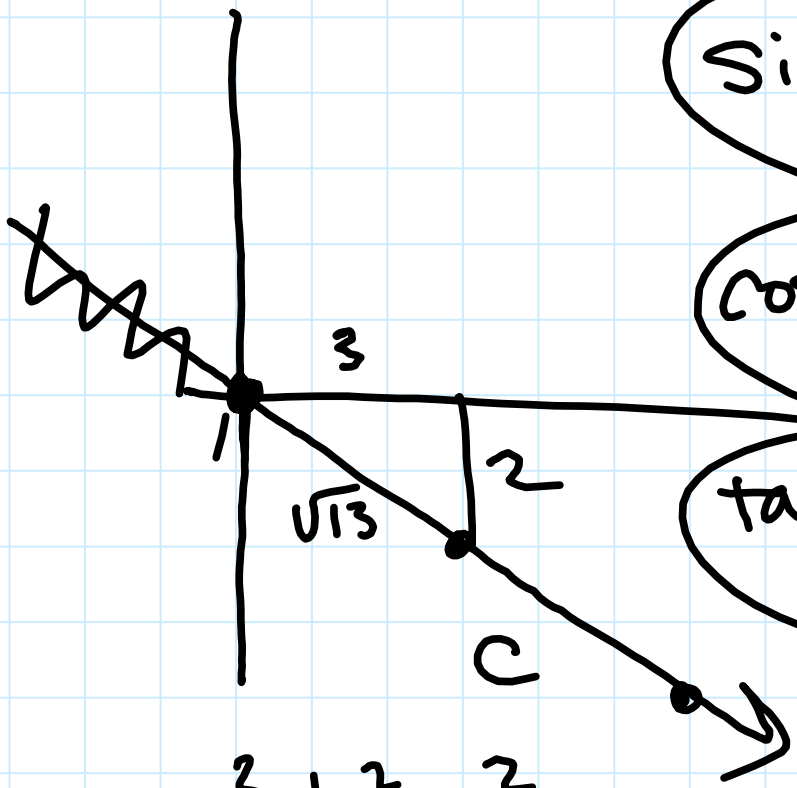
$\tan\theta = \frac{-1}{1}$

32) $2x+3y=0 \quad x \geq 0$

$-2x \quad -2x$

$\frac{3y}{3} = \frac{-2x}{3}$

$y = -\frac{2}{3}x$



$\sin\theta = -\frac{2}{\sqrt{13}}$

$\cos\theta = +\frac{3}{\sqrt{13}}$

$\tan\theta = -\frac{2}{3}$

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

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

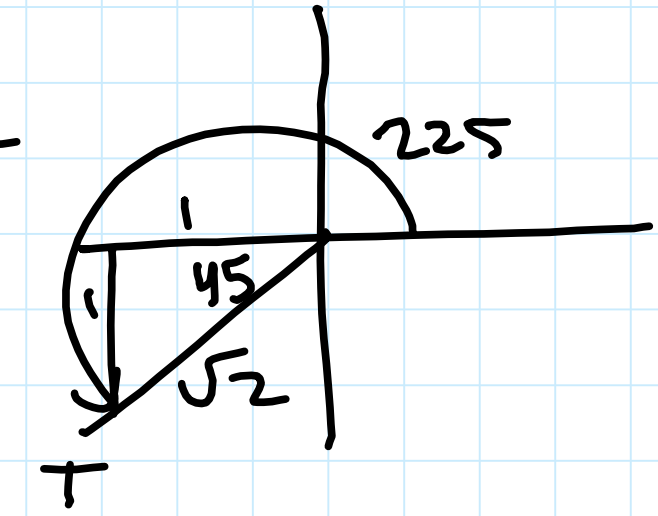
$\sqrt{13} \quad \sqrt{c^2}$

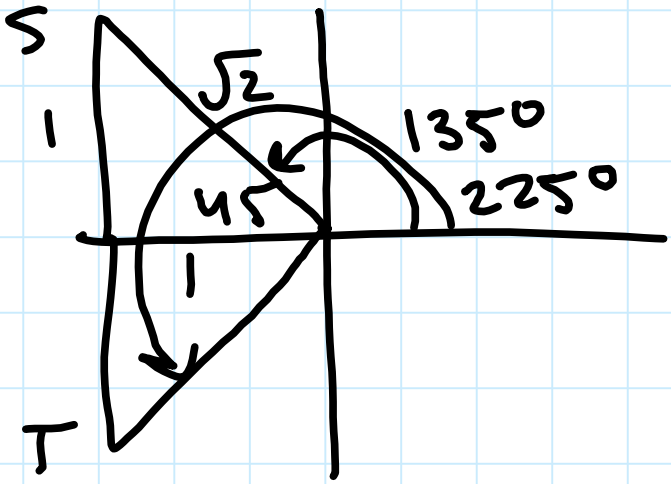
$c=\sqrt{13}$

33) $\sin 225 = -\frac{1}{\sqrt{2}}$

$\cos 135 = -\frac{1}{\sqrt{2}}$

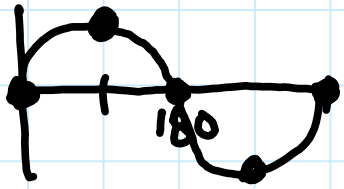
$\cos 225 = -\frac{1}{\sqrt{2}}$



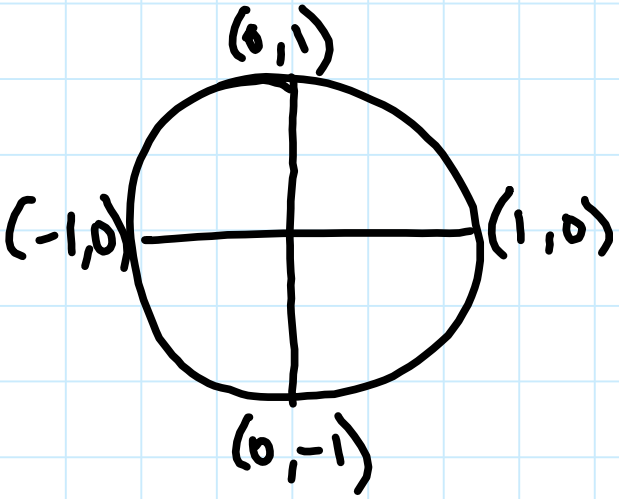


C11 - 2.0 - Q34abc Trig Review

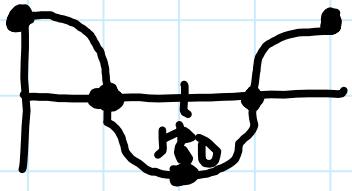
34a) $y = \sin\theta$



x	y
0	0
90	1
180	0
270	-1
360	0

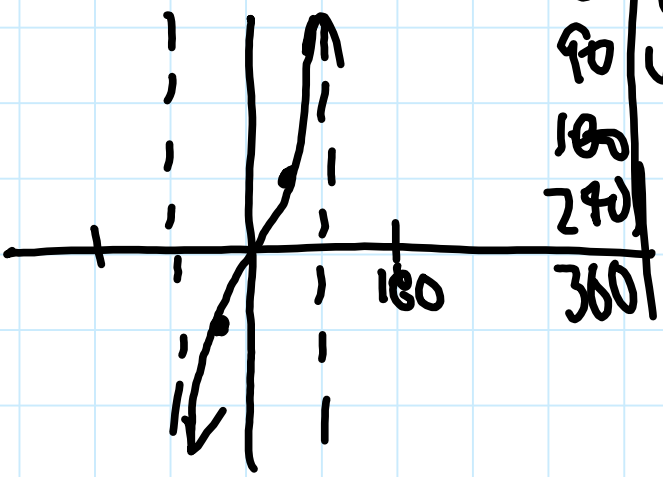


b) $y = \cos\theta$



x	y
0	1
90	0
180	-1
270	0
360	1

c) $y = \tan\theta$



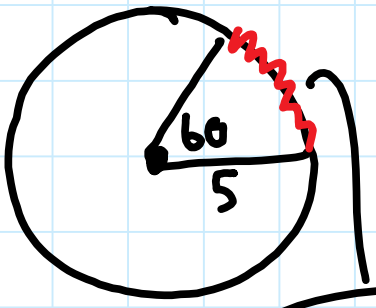
x	y
0	0
90	UND
180	
270	
360	

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

$\tan 45 = 1$

C11 - 2.0 - Q35ab Trig Review

35a)



$\frac{360}{6} = 6$

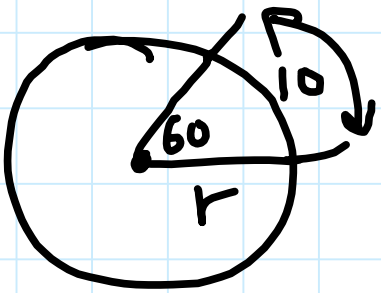
$C = 2\pi r$

$C = 2\pi 5$

$C = \frac{31.4}{6} = 5.23$

arc = 5.23

b)



$$\frac{\theta}{360} = \frac{arc}{2\pi r}$$ *

$$\frac{60}{360} = \frac{10}{2\pi r}$$

$$\frac{1}{6} = \frac{10}{2\pi r}$$

$$\frac{2\pi r}{2\pi} = \frac{60}{2\pi}$$

$$r = \frac{60}{(2\pi)}$$

r = 9.55

36)

$\frac{360}{60} = 6$

$A = \pi r^2$

$A = \pi(5)^2$

$A = \frac{78.54}{6} = 13.1$

$A = 13.1$

$\frac{\theta}{360} = \frac{A_{sec}}{\pi r^2}$

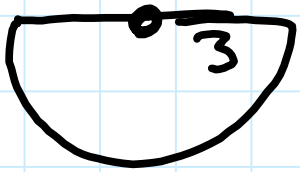
$\frac{60}{360} = \frac{A_{sec}}{\pi(5)^2}$

$25\pi \quad \frac{1}{6} = \frac{A_{sec}}{25\pi} \times 25\pi$

$\frac{25\pi}{6} = A_{sec}$

$A_{sec} = 13.1$

37a)



$C = 2\pi r$

$C = 2\pi(3)$

$C = \frac{18.85}{2} = 9.42 + 6 = 15.42\text{cm}$

$A = \pi r^2$

$A = \pi(3)^2$

$A = \frac{28.27}{2} = 14.14\text{cm}^2$

b)

$\frac{360}{6} = 6$

$C = 2\pi r$

$C = 2\pi 5$

$C = 31.4 \times \frac{5}{6}$

$C = 21.\overline{16}$

$A = \pi r^2$

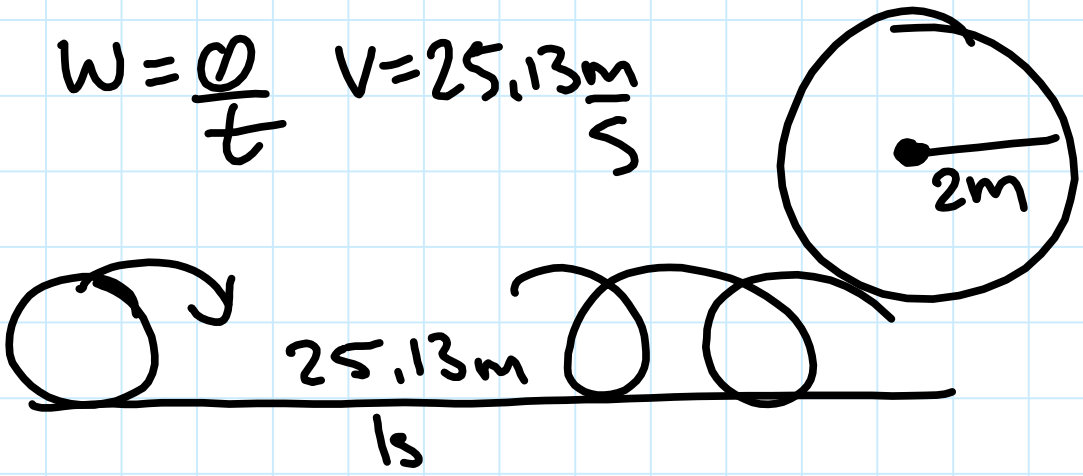
$A = \pi(5)^2$

$A = 78.54 \times \frac{5}{6}$

$A = 65.45\text{cm}^2$

$P = 21.\overline{16} + 5 + 5 = 31.16\text{cm}$

38) $\omega = \frac{\theta}{t}$ $V = 25.13\frac{m}{s}$ $V = \frac{d}{t}$



$C = 2\pi r$

$C = 2\pi(2)$

$C = 12.57m$

$\#TURNS = \frac{25.13}{12.57} = 2 TURNS$

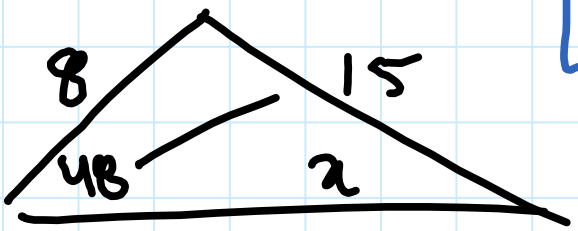
$2 \times 360 = 720°$

$\omega = \frac{720°}{s}$

C11 - 2.0 - Q39ab Trig Review

~~39~~ 39

~~38~~a)



$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

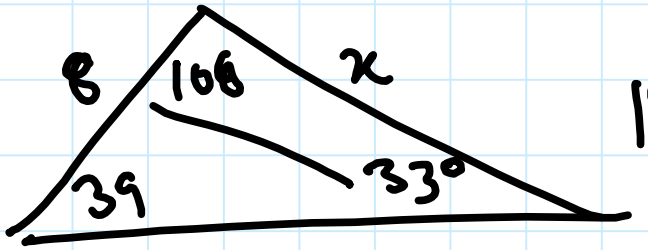
$$\frac{\sin x}{8} = \frac{\sin 48}{15}$$

$$\sin x = 0.396$$

$$x = \sin^{-1}(0.396)$$

$$x = 23.35^\circ$$

b)

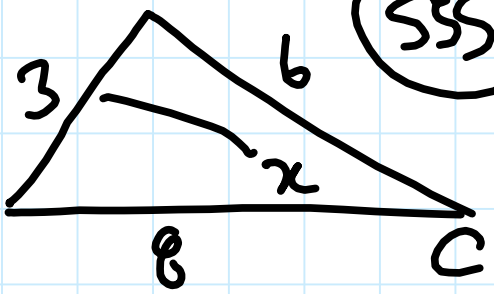


$$180 - 108 - 39 = 33$$

$$\frac{x}{\sin 39} = \frac{8}{\sin 33}$$

$$x = 9.24$$

39c)



SSS $c^2 = a^2 + b^2 - 2ab\cos C$

$3^2 = 6^2 + 8^2 - 2(6)(8)\cos C$

$9 = 100 - 96\cos C$

$-100 \quad -100$

$-91 = -96\cos C$

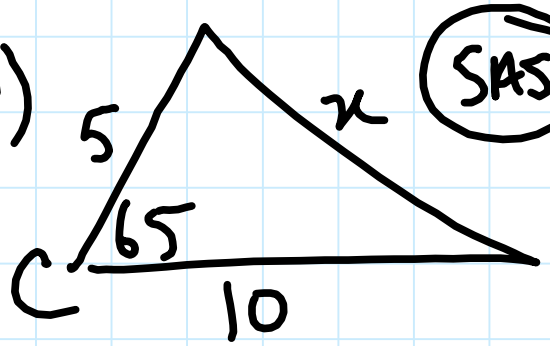
$\frac{-91}{-96} = \frac{-96\cos C}{-96}$

$\cos C = 0.9479$

$C = \cos^{-1}(0.9479)$

$x = C = 18.57°$

d)



SAS $c^2 = a^2 + b^2 - 2ab\cos C$

$x^2 = 5^2 + 10^2 - 2(5)(10)\cos 65$

$\sqrt{x^2} = \sqrt{82.74}$

$x = 9.09$

C11 - 2.0 - Q40abcd Trig Review

40a)

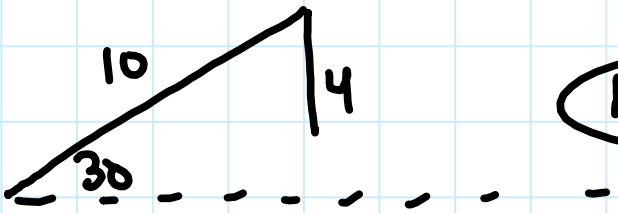
$\sin\theta = \frac{opp}{hyp}$

$10\sin 30 = \frac{opp}{10} \times 10$

$opp = 5$

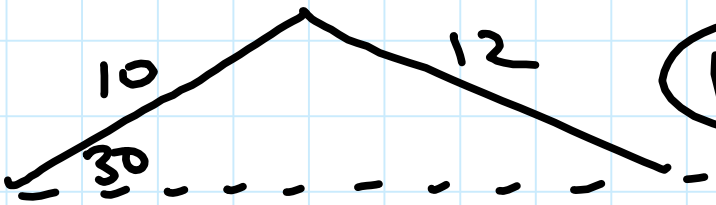
1 TRIANGLE

b)



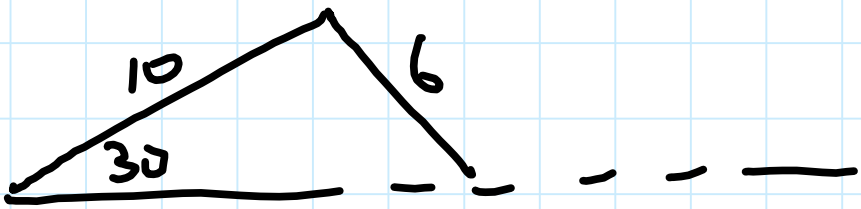
NOT TRIANGLES

c)

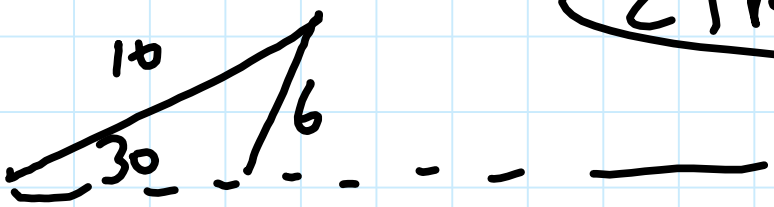


1 TRIANGLES

d)

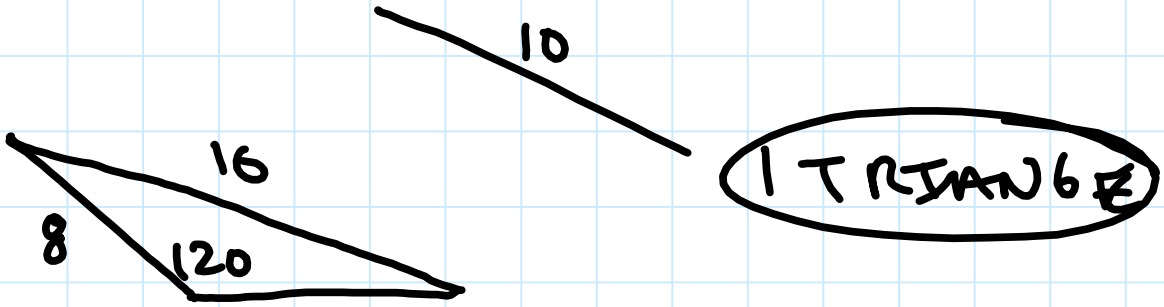


2 TRIANGLES



C11 - 2.0 - Q40ef Trig Review

40 e)



1 TRIANGLE

f)

0 TRIANGLES