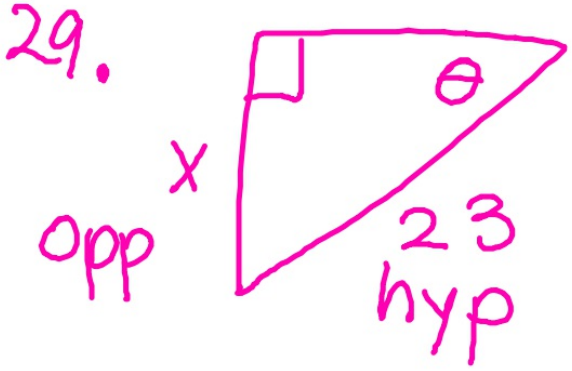
Going over Hand written worksheet from 4-4-14

29.

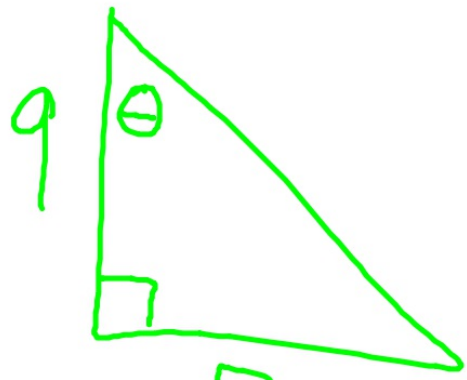


$\sin^{-1}(\sin\theta) = \left(\frac{x}{23}\right)$

$\sin^{-1}$

$\theta = \sin^{-1}\left(\frac{x}{23}\right)$

31.



$\tan^{-1}(\tan\theta) = \tan^{-1}\frac{5}{9}$

$\theta = \tan^{-1}\left(\frac{5}{9}\right) \approx 29.1^{\circ}$

6. $\arctan\left(-\frac{\sqrt{3}}{3}\right)$ $\frac{y}{x}$ – QIV

$\frac{-\pi}{6}$

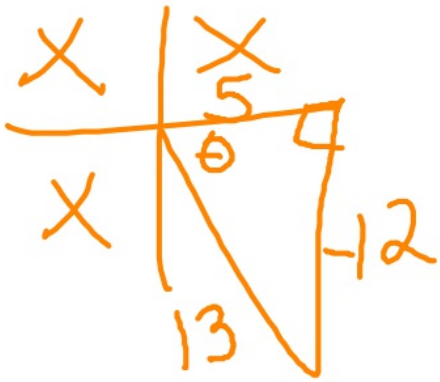
$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

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

$\frac{1}{\sqrt{3}}$ $\frac{\sqrt{3}}{\sqrt{3}}$

$\frac{\sqrt{3}}{3}$

21. $\cot(\sin^{-1}(-\frac{12}{13}))$



$\frac{-5}{12}$

36. $A = 4$ $P = \frac{7\pi}{2}$ $PS = \frac{-\pi}{8}$

$VS = \frac{9}{7}$

$y = d \pm a \sin(bx + c)$

$y = \frac{9}{7} \pm 4 \sin\left(\frac{4}{7}x + \frac{\pi}{14}\right)$

$-\frac{c}{b} = \frac{-\pi}{8}$

$\frac{-c}{\frac{4}{7}} = \frac{-\pi}{8}$

$\frac{2\pi}{b} = \frac{7\pi}{2}$

$7\pi b = 4\pi$

$b = \frac{4}{7}$

$-\frac{4\pi}{7} = -8c \cdot -\frac{1}{8}$

$\frac{\pi}{14} = c$

$\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$

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

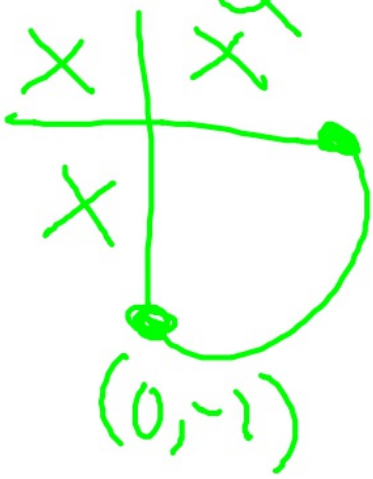
$\frac{\pi}{3}$

Ex

$$\sin^{-1}\left(\tan\frac{7\pi}{4}\right)$$

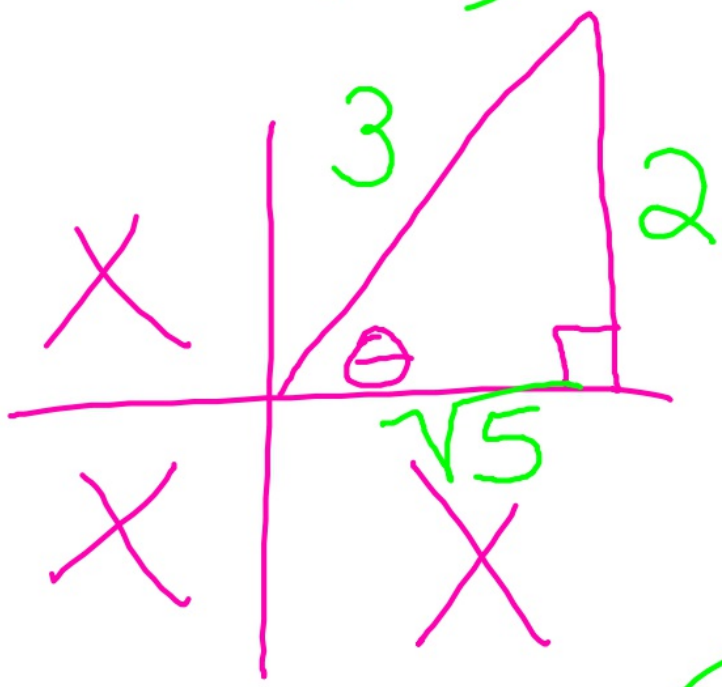
$$\sin^{-1}(-1)$$

$$-\frac{\pi}{2}$$



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

24. $\tan(\arcsin(\frac{2}{3}))$

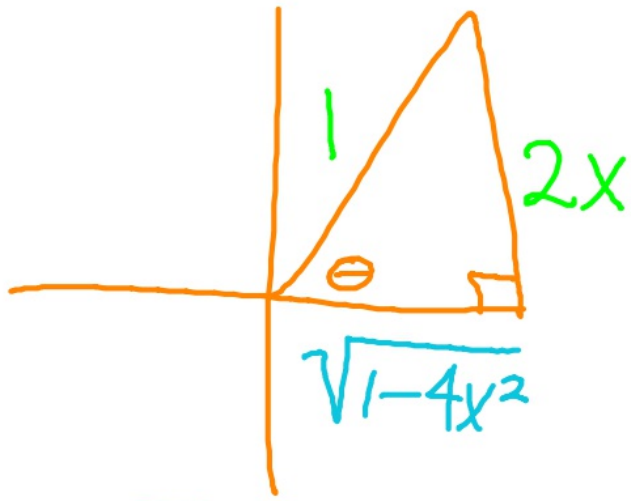


$3^2 = 2^2 + l^2$

$l = \sqrt{5}$

$$\frac{2}{\sqrt{5}}$$

27. $\cot(\arcsin(2x))$



$\frac{\sqrt{1-4x^2}}{2x}$

$1^2 = (2x)^2 + (\ell)^2$

$1 = 4x^2 + \ell^2$

$\sqrt{1-4x^2} = \sqrt{\ell^2}$

$\sqrt{1-4x^2} = \ell$

Practice for Quiz on 4-8-14

1. $\arcsin\left(\frac{\sqrt{2}}{2}\right)$ $\frac{\pi}{4}$

2. $\arctan(\sqrt{3})$ $\frac{\pi}{3}$

3. $\sin^{-1}(0)$ or

4. $\cos^{-1}\left(\frac{1}{2}\right)$ $\frac{\pi}{3}$

5. $\sin^{-1}(4)$

dne

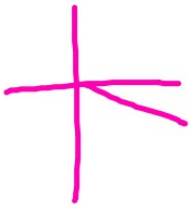
$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\frac{1}{\sqrt{3}}$

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

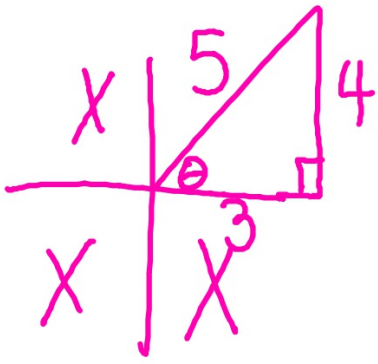
$\sin^{-1}(\sin\frac{11\pi}{6})$

$\frac{-\pi}{6}$



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

$\sin(\arctan\frac{4}{3})$



$\frac{4}{5}$

Law of Sines and Cosines

*oblique triangle: non-right triangle

*remember your geometry:

*angles of a triangle sum to 180 degrees

*across from the bigger angle is the bigger side, etc.... and vice versa

*lowercase letters are sides & uppercase letters are angles

*Law of Sines $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

*Law of Cosines

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$b^2 = a^2 + c^2 - 2ac\cos B$$

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

*The law of sines is used when an angle-side combo is present. A/a or B/b or C/c

*The law of cosines is used when the law of sines cannot be!

*For the law of cosines, it is VERY important to always find the LARGEST angle first when appropriate.

*For the law of sines, be wary when A.S.S. shows up! no solution, one solution, or two solutions

*Area of a triangle when you don't have an altitude----

Heron's Thm: given 3 sides find ~~A~~ K

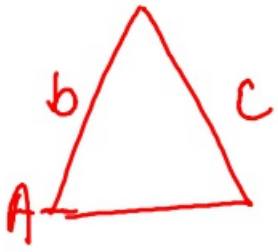
$$S=\frac{a+b+c}{2}\ ;\ K=\sqrt{S(S-a)(S-b)(S-c)}$$

When given SAS:

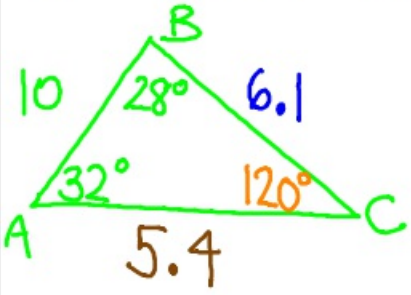
$$K=\frac{1}{2}ab\sin C$$

$$K=\frac{1}{2}ac\sin B$$

$$K=\frac{1}{2}bc\sin A$$



Ex $A=32°$ $B=28°$ $c=10$



$C=180°-28°-32°$

$C=120°$

$$\frac{10}{\sin 120°}=\frac{a}{\sin 32°}$$

$$a\sin 120°=10\sin 32°$$

$$a=\frac{10\sin 32°}{\sin 120°}$$

$a=6.1$

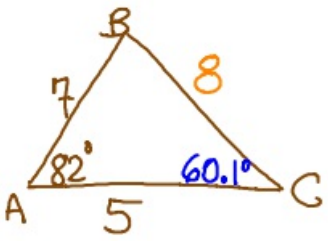
$$\frac{10}{\sin 120°}=\frac{b}{\sin 28°}$$

$$b=\frac{10\sin 28°}{\sin 120°}$$

$b=5.4$

Not A.S.S. so only have the posibility of one solution. And we can use the law of sines as the original information gave a side/angle combo

B. $A = 82°$ $b = 5$ $c = 7$



$a^2 = b^2 + c^2 - 2bc\cos A$

$a^2 = 25 + 49 - 2(35)\cos 82$

$a^2 = 74 - 70\cos 82°$

$a = \sqrt{74 - 70\cos 82°}$

$a = 8$

$\frac{8}{\sin 82°} = \frac{7}{\sin C}$

$8\sin C = 7\sin 82°$

$\sin C = \frac{7}{8}\sin 82°$

$C = \sin^{-1}\left(\frac{7}{8}\sin 82°\right)$

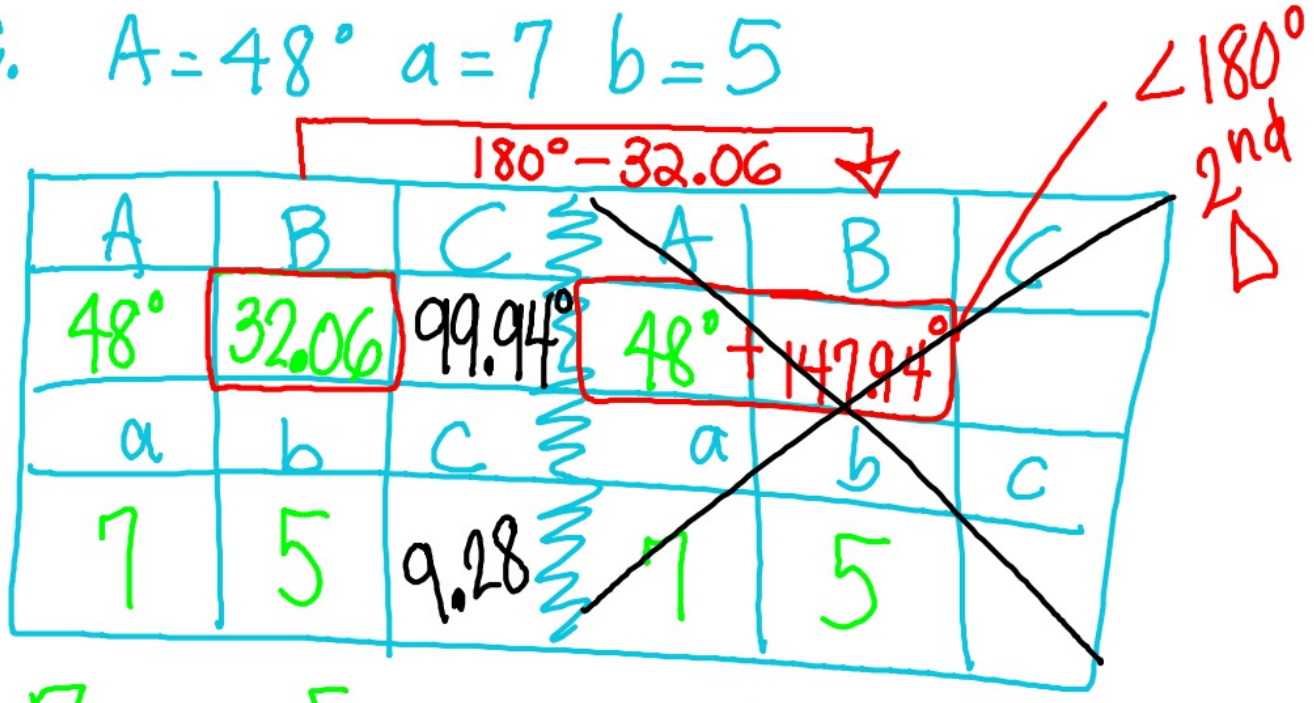
$C = 60.1°$

$180° - 82° - 60.1° =$

$B = 37.9°$

Used law of cosines as there wasn't a side/angle combo in the original inf

C. $A = 48^\circ \quad a = 7 \quad b = 5$



$$\frac{7}{\sin 48^\circ} = \frac{5}{\sin B}$$

$$B = \sin^{-1}\left[\frac{5\sin 48^\circ}{7}\right]$$

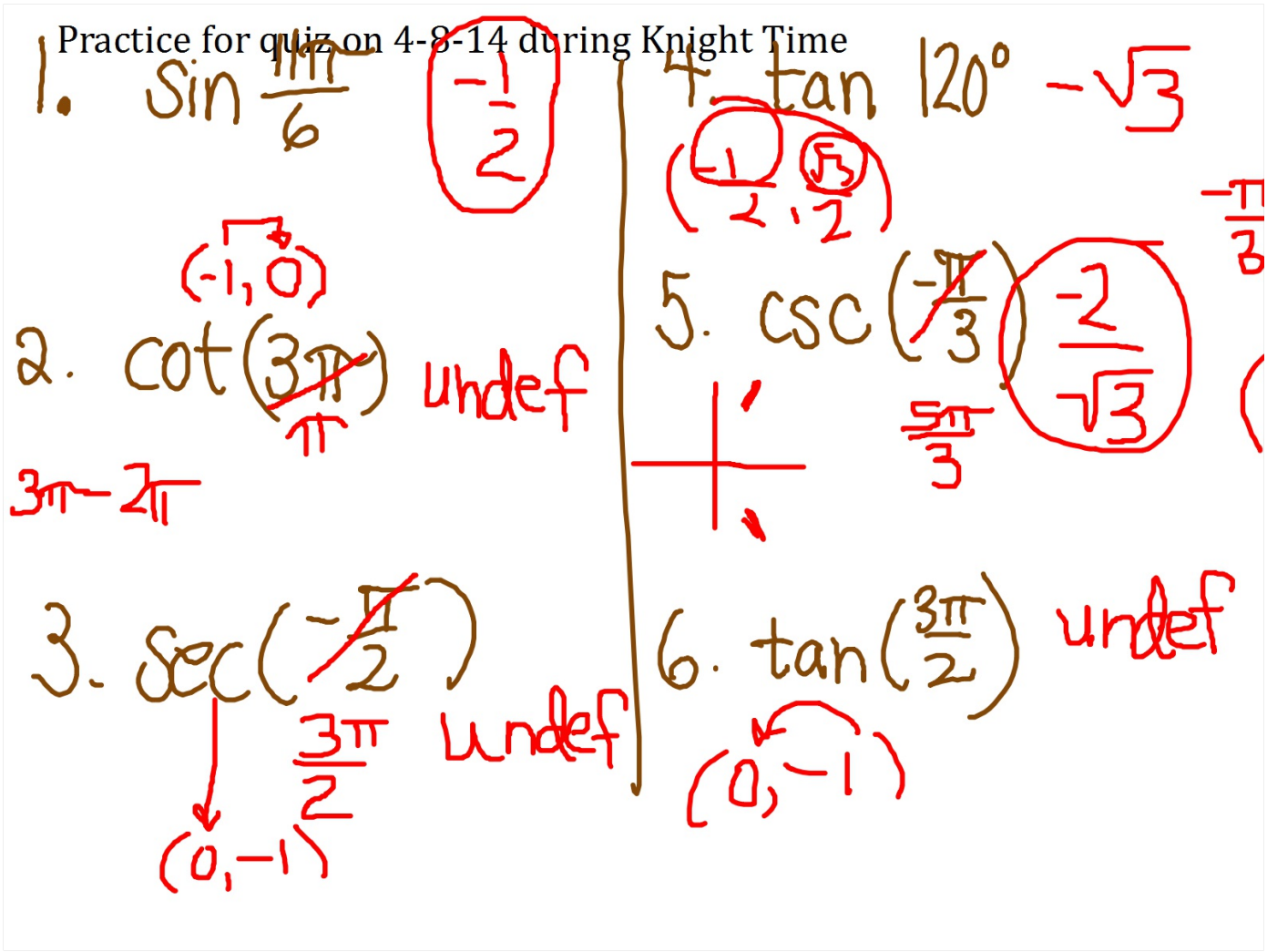
$$\frac{c}{\sin 99.94^\circ} = \frac{7}{\sin 48^\circ}$$

$$c = \frac{7\sin 99.94^\circ}{\sin 48^\circ}$$

$$c = 9.28$$

A.S.S. so need to worry about a second solution. Only have a second solution if the supplement of the first angle you find, along with the original angle given has a sum less than 180 degrees....more to come tomorrow on this matter.

Practice for quiz on 4-8-14 during Knight Time



7. $\sec\left(\frac{5\pi}{6}\right)$

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

8. $\cos\left(-\frac{7\pi}{4}\right)$

$\frac{\sqrt{2}}{2}$

9. $\cot\left(\frac{4\pi}{3}\right)$

$\frac{1}{\sqrt{3}}$

10. $\csc(200\pi)$

$(1,0)$ undef

$\frac{1}{0}$

11. $\cot 0^\circ$ $(1,0)$

undef

12. $\tan\frac{\pi}{4}$

Simplify

1. $\sin^{-1}\left(\frac{1}{2}\right)$

$\frac{\pi}{6}$

2. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

$\frac{5\pi}{6}$

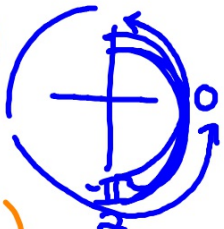
3. $\arctan(\sqrt{3})$ $\frac{\pi}{3}$

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

4. $\arccos(5)$

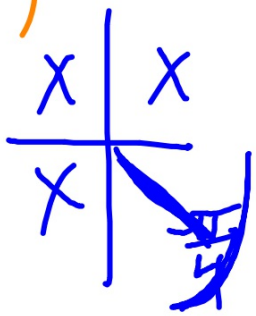
$\therefore$ dne

5. $\arcsin(0)$

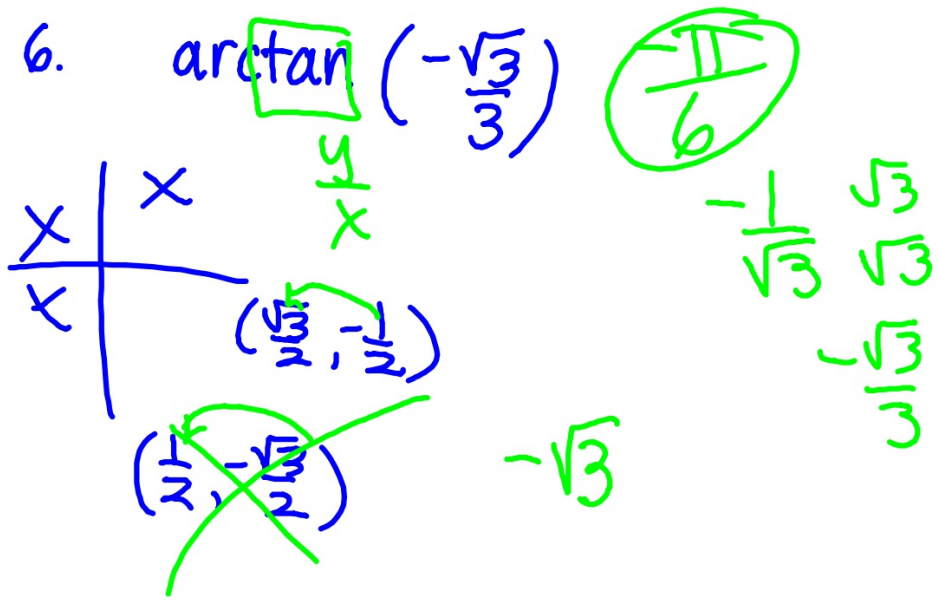


6. $\tan^{-1}(-1)$

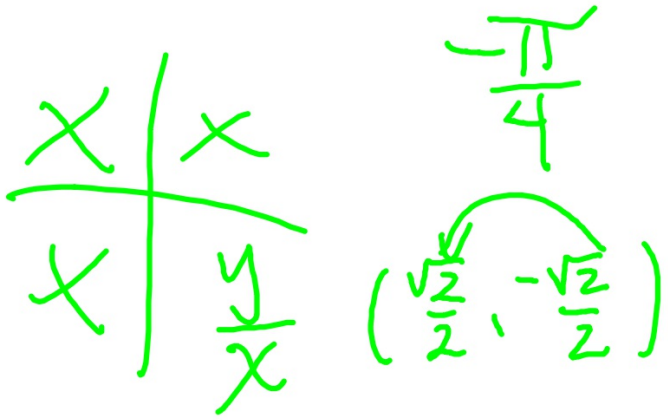
$\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$



More homework questions from hand written worksheet



10. $\tan^{-1}(-1)$



16. $\arccos\left(\cos\frac{2\pi}{3}\right)$

$\frac{2\pi}{3}$

$\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$

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

$\frac{\pi}{3}$

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

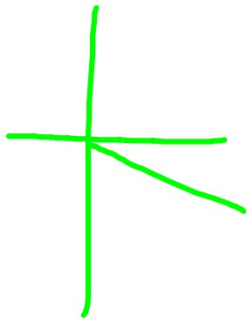
$\tan^{-1}\left(\tan\frac{5\pi}{6}\right)$

$\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)$

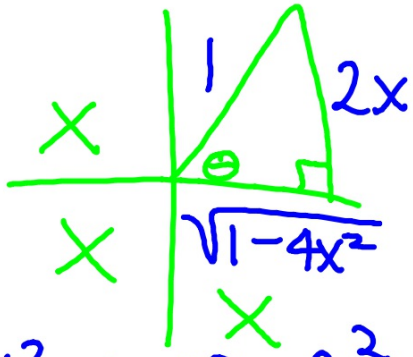
$-\frac{\pi}{6}$

$\sin^{-1}\left(\sin\frac{11\pi}{6}\right)$

$-\frac{\pi}{6}$



27. $\cot(\arcsin(2x))$



$$\frac{\sqrt{1-4x^2}}{2x}$$

$1^2 = (2x)^2 + l^2$

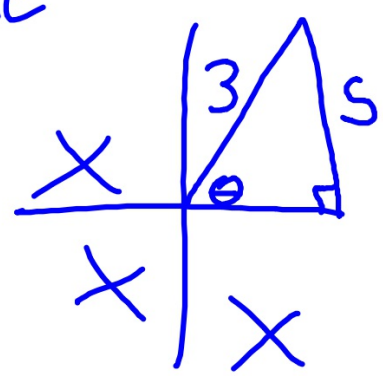
$1 = 4x^2 + l^2$

$\sqrt{l^2} = \sqrt{1-4x^2}$

$l = \sqrt{1-4x^2}$

28. $\cos(\arcsin(\frac{5}{3}))$

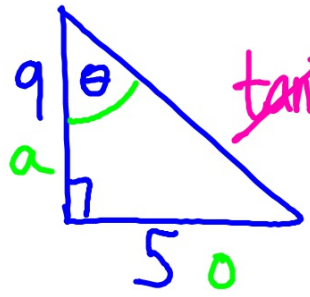
dne



5. $\arcsin(2)$

dne

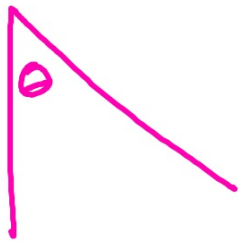
31.



$\tan^{-1}(\tan\theta) = \left(\frac{5}{9}\right)$

$\theta = \tan^{-1}\left(\frac{5}{9}\right)$

$\theta = 29.1^{\circ}$

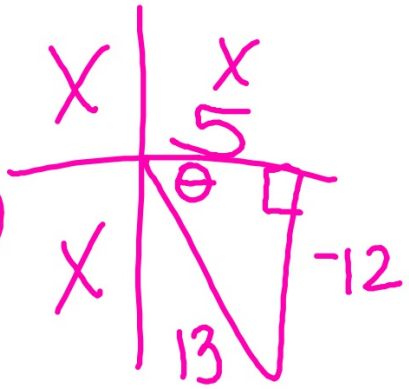


21. $\cot(\sin^{-1}(\frac{-12}{13}))$

$\frac{5}{-12}$

$\sin ? = \frac{-12}{13}$

$? = \sin^{-1}(\frac{-12}{13})$



$13^2 = (12)^2 + l^2$

$l = 5$