Review for Trig Quick Quiz #1 **Name:** Answers

(The quick quiz will be next class and worth approximately 30 points)

Find an angle θ (where $0° \le \theta \le 360°$) that is co-terminal with:

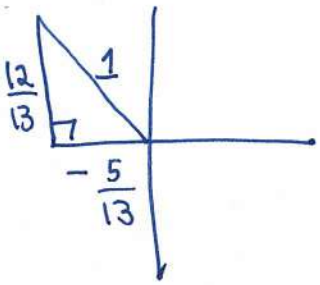
1 $470°$ — $470 - 360 = 110$ — $110°$

2 $-170°$ — $360 - 170 = 190$ — $190°$

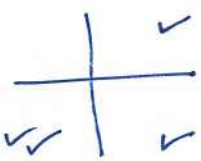
3 In a unit circle, if the terminal side of angle θ in standard position goes through the point $\left(-\frac{5}{13}, \frac{12}{13}\right)$, find the following. (*Note*: The hypotenuse = 1)

$\sin\theta = \frac{12}{13}$ $\quad \cos\theta = \frac{-5}{13}$ $\quad \tan\theta = -\frac{12}{5}$

$\csc\theta = \frac{13}{12}$ $\quad \sec\theta = -\frac{13}{5}$ $\quad \cot\theta = \frac{-5}{12}$

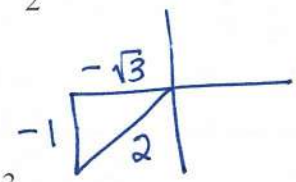


4 If $\sin\theta < 0$ and $\tan\theta > 0$, then θ is in what quadrant?



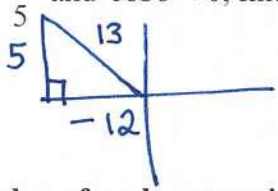
III

5 If $\cos\theta = -\frac{\sqrt{3}}{2}$ and $\cot\theta > 0$, find $\sin\theta$



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

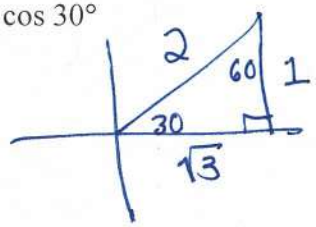
6 If $\csc\theta = \frac{13}{5}$ and $\cos\theta < 0$, find $\cot\theta$.



$\cot\theta = -\frac{12}{5}$

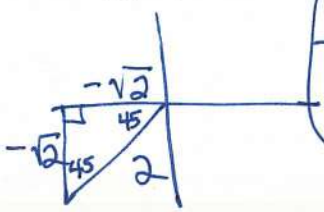
Find the <u>exact value</u> of each expression below. Show your work where appropriate.

7 $\cos 30°$



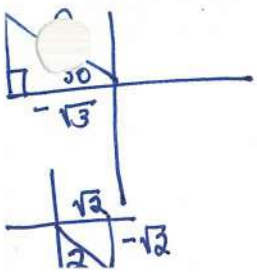
$\frac{\sqrt{3}}{2}$

8 $\sin 225°$



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

9 $\csc 150° + \cot 315°$



Use diagrams or put in calc.

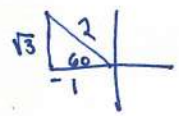
$\frac{1}{\sin(150°)} + \frac{1}{\tan(315°)}$

$2 + -1$

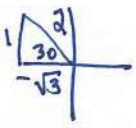
1

10 If $f(x) = 2\tan 4x - 3\sin 5x$, find $f(30°)$

$f(30) = 2\tan(120) - 3\sin(150)$



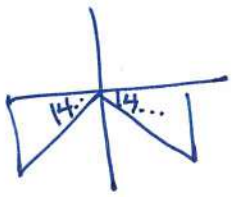
$= 2 \cdot -\frac{\sqrt{3}}{1} - 3 \cdot \frac{1}{2}$



$= -2\sqrt{3} - \frac{3}{2}$ or $-\frac{4\sqrt{3}-3}{2}$

Solve for θ such that $0° \le \theta < 360°$. If you get a θ that is not a whole degree, round answers to nearest minute.

11 $\sin\theta = -\frac{1}{4}$



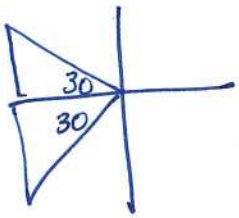
$\sin^{-1}\left(\frac{1}{4}\right)$
$= 14.4775...$

$\theta = 180 + 14.4775 = 194.4775...$
$360 - 14.4775 = 345.5224$

$\theta = 194^\circ 29', 345^\circ 31'$

12 $\cos\theta = -\frac{\sqrt{3}}{2}$

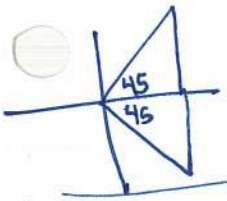
$\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = 30^\circ$



$\theta = 150^\circ, 210^\circ$

13 $2\cos\theta - \sqrt{2} = 0$

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

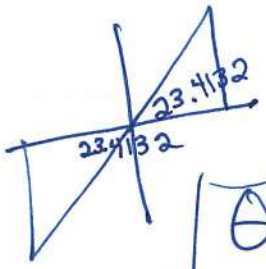


$\theta = 45^\circ, 315^\circ$

14 $5\tan\theta - \tan\theta = \sqrt{3}$

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

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



$\theta = 23.4132...$

$\theta = 23^\circ 25', 203^\circ 25'$

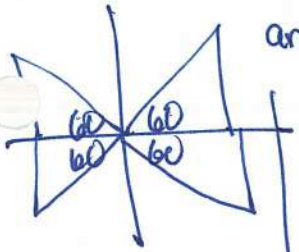
15 $\tan^2\theta - 1 = 2$

$\sqrt{\tan^2\theta} = \sqrt{3}$

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

(or do quad. formula)
$x^2 - 3 = 0$

$\arctan(\sqrt{3}) = 60^\circ$



$\theta = 60^\circ, 120^\circ, 240^\circ, 300^\circ$

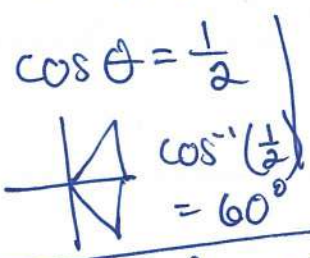
16 $2\cos^2\theta + \cos\theta - 1 = 0$

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

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

$x = \frac{1}{2}, \quad x = -1$

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



$\theta = 60^\circ, 300^\circ, 180^\circ$

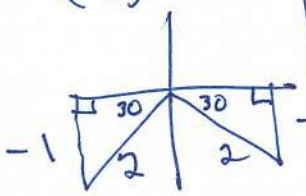
Solve for θ such that $0° < \theta \le 360°$. If you get a θ that is not a whole degree, round answers to nearest degree.

17 $2\cos\theta\tan\theta - 1 = -2$

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

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

$\sin^{-1}\left(-\frac{1}{2}\right) = -30°$



$\theta = 210°, 330°$

18 $2\sin^2\theta + \cos\theta = 1$

since $\cos^2\theta + \sin^2\theta = 1$

$\sin^2\theta = 1 - \cos^2\theta$

$2(1-\cos^2\theta) + \cos\theta - 1 = 0$

$2 - 2\cos^2\theta + \cos\theta - 1 = 0$

$-2\cos^2\theta + \cos\theta + 1 = 0$

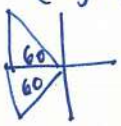
$2\cos^2\theta - \cos\theta - 1 = 0$

$2x^2 - x - 1 = 0$

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

$x = -\frac{1}{2}, \quad x = 1$

$\cos^{-1}\left(-\frac{1}{2}\right) = 120°$ $\quad \cos\theta = -\frac{1}{2}$ | $\cos\theta = 1$ $\quad \cos^{-1}(1) = 0$



$\theta = 120°, 240°,$ | $360°$

19 $2\cos 2\theta + \cos\theta = 1$

- choose a handy identity from reference sheet

$\cos 2\theta = 2\cos^2\theta - 1$

$2(2\cos^2\theta - 1) + \cos\theta - 1 = 0$

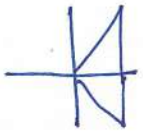
$4\cos^2\theta - 2 + \cos\theta - 1 = 0$

$4x^2 + x - 3 = 0$

$(4x-3)(x+1) = 0$

$x = \frac{3}{4} \quad x = -1$

$\cos\theta = \frac{3}{4}, \quad \cos\theta = -1$



$\cos^{-1}\left(\frac{3}{4}\right) \approx 41° \quad \cos^{-1}(-1) = 180°$

$\theta = 41°, 180°, 319°$

20 $\cos\theta - \cos\theta\sin\theta = 0$

...tricky! Let's factor out a GCF.

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

$\cos\theta = 0, \quad 1 - \sin\theta = 0$

$\cos^{-1}(0) = 90° \quad 1 = \sin\theta$

$\sin^{-1}(1) = 90°$

$\theta = 90°, 270°$

Rewrite the following trig equations in simplest form so that you could solve them. DO NOT SOLVE these (but you should know how to).

21 $2\sec^2\theta - 3\tan\theta = 1$

$1 + \tan^2\theta = \sec^2\theta$

Use Pythag. Trig i.d.

$2(1+\tan^2\theta) - 3\tan\theta - 1 = 0$

$2 + 2\tan^2\theta - 3\tan\theta - 1 = 0$

$2\tan^2\theta - 3\tan\theta + 1 = 0$

etc.

22 $\sin 2\theta + 2\cos\theta = 0$

Use double angle from lavender reference sheet

$2\sin\theta\cos\theta + 2\cos\theta = 0$

etc.

Note:

- there's only 1 to choose from

to solve this, you'd factor out GCF of $\cos\theta$

$\cos\theta(2\sin\theta + 2) = 0$

$\cos\theta = 0, \quad 2\sin\theta + 2 = 0$

$\sin\theta = -1$

etc.