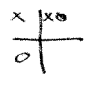
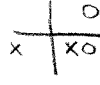

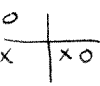
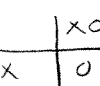



DO NOT use a calculator on this assignment!

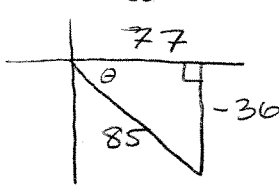
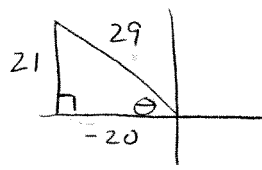
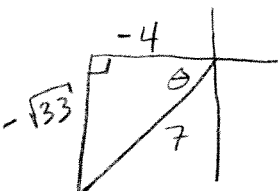
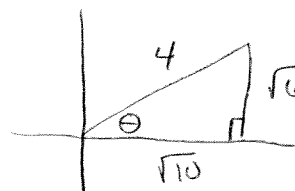
Some Pythagorean Triples: (You don't need to memorize these. They may be helpful for this assignment, though.)

3, 4, 5	5, 12, 13	7, 24, 25	8, 15, 17	9, 40, 41	11, 60, 61	12, 35, 37	13, 84, 85
16, 63, 65	20, 21, 29	28, 45, 53	33, 56, 65	36, 77, 85	39, 80, 89	48, 55, 73	65, 72, 97

Name the quadrant in which angle θ lies.

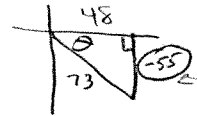
<p>1. $\sin \theta > 0, \tan \theta > 0$</p>  <p>QUADRANT I</p>	<p>2. $\sin \theta < 0, \sec \theta > 0$</p>  <p>QUADRANT II</p>	<p>3. $\cos \theta < 0, \csc \theta < 0$</p>  <p>QUADRANT III</p>
<p>4. $\sin \theta < 0, \cot \theta < 0$</p>  <p>QUADRANT IV</p>	<p>5. $\cot \theta > 0, \cos \theta > 0$</p>  <p>QUADRANT I</p>	<p>6. $\tan \theta < 0, \sin \theta > 0$</p>  <p>QUADRANT II</p>

Given $\sin \theta$ and $\cos \theta$, find the exact values of the remaining trigonometric functions.

<p>7. $\sin \theta = -\frac{36}{85}$ and $\cos \theta = \frac{77}{85}$</p>  <p>$\csc \theta = -\frac{85}{36}$ $\sec \theta = \frac{85}{77}$</p> <p>$\tan \theta = -\frac{36}{77}$ $\cot \theta = -\frac{77}{36}$</p>	<p>8. $\sin \theta = \frac{21}{29}$ and $\cos \theta = -\frac{20}{29}$</p>  <p>$\csc \theta = \frac{29}{21}$ $\sec \theta = -\frac{29}{20}$</p> <p>$\tan \theta = -\frac{21}{20}$ $\cot \theta = -\frac{20}{21}$</p>
<p>9. $\sin \theta = -\frac{\sqrt{33}}{7}$ and $\cos \theta = -\frac{4}{7}$</p>  <p>$\csc \theta = \frac{-7}{\sqrt{33}} = -\frac{7\sqrt{33}}{33}$ $\sec \theta = -\frac{7}{4}$</p> <p>$\tan \theta = \frac{\sqrt{33}}{4}$ $\cot \theta = \frac{4\sqrt{33}}{33}$</p>	<p>10. $\sin \theta = \frac{\sqrt{6}}{4}$ and $\cos \theta = \frac{\sqrt{10}}{4}$</p>  <p>$\csc \theta = \frac{4}{\sqrt{6}} = \frac{4\sqrt{6}}{6} = \frac{2\sqrt{6}}{3}$ $\sec \theta = \frac{4}{\sqrt{10}} = \frac{4\sqrt{10}}{10} = \frac{2\sqrt{10}}{5}$</p> <p>$\tan \theta = \frac{\sqrt{6}}{\sqrt{10}} = \frac{\sqrt{15}}{5}$ $\cot \theta = \frac{\sqrt{15}}{3}$</p>

Find the exact values of each trigonometric function using the given information.


11. $\cos \theta = \frac{48}{73}$ and θ is in quadrant IV



$48^2 + y^2 = 73^2$
 $2304 + y^2 = 5329$
 $y^2 = 3029$
 $y = \pm \sqrt{3029}$
 $y = -55$

$\sin \theta = \frac{-55}{73}$
 $\csc \theta = \frac{-73}{55}$
 $\cos \theta = \frac{48}{73}$
 $\sec \theta = \frac{73}{48}$
 $\tan \theta = \frac{-55}{48}$
 $\cot \theta = \frac{-48}{55}$

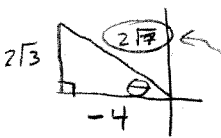
12. $\csc \theta = -\frac{37}{12}$ and $\pi < \theta < \frac{3\pi}{2}$



$x^2 + (-12)^2 = 37^2$
 $x^2 + 144 = 1369$
 $x^2 = 1225$
 $x = \pm \sqrt{1225}$
 $x = -35$

$\sin \theta = \frac{-12}{37}$
 $\csc \theta = \frac{-37}{12}$
 $\cos \theta = \frac{-35}{37}$
 $\sec \theta = \frac{-37}{35}$
 $\tan \theta = \frac{12}{35}$
 $\cot \theta = \frac{35}{12}$

13. $\tan \theta = -\frac{2\sqrt{3}}{4}$ and $\sin \theta > 0$



$x^2 + y^2 = r^2$
 $(-4)^2 + (2\sqrt{3})^2 = r^2$
 $16 + 12 = r^2$
 $28 = r^2$
 $\pm \sqrt{28} = r$
 $2\sqrt{7} = r$

$\sin \theta = \frac{2\sqrt{3}}{2\sqrt{7}} = \frac{\sqrt{21}}{7}$
 $\csc \theta = \frac{7}{\sqrt{21}}$
 $\cos \theta = \frac{-4}{2\sqrt{7}} = \frac{-2\sqrt{7}}{7}$
 $\sec \theta = \frac{-7}{2\sqrt{7}}$
 $\tan \theta = \frac{-2\sqrt{3}}{4}$
 $\cot \theta = \frac{-4}{2\sqrt{3}} = \frac{-2\sqrt{3}}{3}$

Fundamental Trig Identities	$\tan \theta = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}$	$\cot \theta = \frac{x}{y} = \frac{\cos \theta}{\sin \theta}$
$\csc \theta = \frac{1}{y} = \frac{1}{\sin \theta}$	$\sec \theta = \frac{1}{x} = \frac{1}{\cos \theta}$	$\cot \theta = \frac{1}{\tan \theta}$
$\sin^2 \theta + \cos^2 \theta = 1$	$\tan^2 \theta + 1 = \sec^2 \theta$	$\cot^2 \theta + 1 = \csc^2 \theta$

Use the Fundamental Trig Identities to find the exact value of each expression.

14. $\sin^2 36^\circ + \cos^2 36^\circ$ 	15. $\tan 14^\circ - \frac{\sin 14^\circ}{\cos 14^\circ}$ $\tan 14 - (\tan 14)$ ○	16. $\sec 15^\circ \cos 15^\circ$ $\left(\frac{1}{\cos 15^\circ}\right)(\cos 15^\circ)$
17. $\cot \frac{3\pi}{7} \tan \frac{3\pi}{7}$ $\left(\frac{1}{\tan(\frac{3\pi}{7})}\right)\left(\tan \frac{3\pi}{7}\right)$ 	18. $\sin^2 \frac{7\pi}{12} + \cos^2 \frac{7\pi}{12}$ 	19. $\cot^2 19^\circ - \csc^2 19^\circ$ $\frac{\cos^2 19^\circ}{\sin^2 19^\circ} - \frac{1}{\sin^2 19^\circ}$ $\frac{\cos^2 19^\circ - 1}{\sin^2 19^\circ} \Rightarrow \frac{-\sin^2 19^\circ}{\sin^2 19^\circ}$ $\Rightarrow -1$