

Math 2200. Section 2.2 Practice

1. Sketch angles in standard position so that the terminal arm passes through each point.  
 a) (1, 5)    b) (4, -3)    c) (-5, 12)    d) (2, 0)

2. Determine the exact values of the sine, cosine, and tangent ratios for each angle in #1.

$\tan \theta = \frac{3}{7}$   
 $\therefore \sin \theta = \frac{-3}{5}$   
 $\cos \theta = \frac{4}{5}$

b)  $r^2 = (4)^2 + (-3)^2$   
 $r = 5$   
 $\sin \theta = 0$   
 $\cos \theta = \frac{2}{2} = 1$   
 $\tan \theta = \frac{0}{2} = 0$

3. Determine the exact values of the sine, cosine, and tangent ratios for each angle.

a)  $\sin 135^\circ = \frac{1}{\sqrt{2}}$   
 $\cos 135^\circ = -\frac{1}{\sqrt{2}}$   
 $\tan 135^\circ = -1$

b)  $\theta = 60^\circ$   
 $\sin 240^\circ = -\frac{1}{2}$   
 $\cos 240^\circ = -\frac{\sqrt{3}}{2}$   
 $\tan 240^\circ = \frac{1}{\sqrt{3}}$

c)  $\sin 330^\circ = -\frac{1}{2}$   
 $\cos 330^\circ = \frac{\sqrt{3}}{2}$   
 $\tan 330^\circ = -\frac{1}{\sqrt{3}}$

4. Without using a calculator, state whether each ratio is positive or negative.  
 a)  $\sin 100^\circ$     b)  $\cos 200^\circ$     c)  $\tan 300^\circ$     d)  $\sin 350^\circ$

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5. An angle is in standard position with its terminal arm in the stated quadrant. Determine the exact values for the other two primary trigonometric ratios for each.  
 a)  $\sin \theta = \frac{-2}{5}$ ; quadrant III    b)  $\cos \theta = \frac{2}{3}$ ; quadrant IV    c)  $\tan \theta = \frac{-5}{12}$ ; quadrant II

a)  $x^2 + (-2)^2 = 5^2$   
 $x^2 = 25 - 4 = 21$   
 $x = \pm\sqrt{21}$   
 $\cos \theta = \frac{-4}{5}$   
 $\tan \theta = \frac{-3}{-4} = \frac{3}{4}$

b)  $x^2 + (-3)^2 = 5^2$   
 $x^2 = 25 - 9 = 16$   
 $x = \pm 4$   
 $\sin \theta = \frac{-4}{5}$   
 $\tan \theta = \frac{-3}{-4} = \frac{3}{4}$

c)  $x^2 + (-5)^2 = 12^2$   
 $x^2 = 144 - 25 = 119$   
 $x = \pm\sqrt{119}$   
 $\sin \theta = \frac{-5}{12}$   
 $\cos \theta = \frac{-\sqrt{119}}{12}$

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6. Solve each equation, for  $0^\circ \leq \theta < 360^\circ$ . Do not use a calculator.

a)  $\sin \theta = \frac{-1}{\sqrt{2}}$   
 $\theta_r = \sin^{-1}(\frac{1}{\sqrt{2}}) = 45^\circ$   
 $\theta_1 = 360 - 45 = 315^\circ$   
 $\theta_2 = 180 + 45 = 225^\circ$

b)  $\tan \theta = \frac{1}{\sqrt{3}}$   
 $\theta_r = \tan^{-1}(\frac{1}{\sqrt{3}})$   
 $\theta_r = 30^\circ$   
 $\theta_1 = 30^\circ$   
 $\theta_2 = 210^\circ$

c)  $\cos \theta = \frac{\sqrt{3}}{2}$   
 $\theta_r = \cos^{-1}(\frac{\sqrt{3}}{2}) = 30^\circ$   
 $\theta_1 = 30^\circ$   
 $\theta_2 = 330^\circ$

7. Solve each equation, for  $0^\circ \leq \theta < 360^\circ$ .

a)  $\sin \theta = 0.7760$   
 $\theta_r = \sin^{-1}(0.7760) = 51^\circ$  Ref L  
 $\theta_1 = 51^\circ$ ,  $\theta_2 = 180 - 51 = 129^\circ$

b)  $\cos \theta = -0.8090$   
 $\theta_r = \cos^{-1}(0.8090)$   
 $\theta_1 = 36^\circ$ ,  $\theta_2 = 180 - 36 = 144^\circ$

c)  $\tan \theta = -0.9004$   
 $\theta_r = \tan^{-1}(0.9004)$   
 $\theta_1 = 42^\circ$ ,  $\theta_2 = 180 - 42 = 138^\circ$

d)  $\sin \theta = -0.9848$   
 $\theta_r = \sin^{-1}(0.9848)$   
 $\theta_1 = 81^\circ$ ,  $\theta_2 = 180 + 81 = 261^\circ$

8. Is each statement true or false? Justify your answer.  
 F a)  $\sin 120^\circ = \cos 210^\circ$   
 b)  $\cos 170^\circ = \cos 350^\circ$   
 c)  $\sin 200^\circ = \sin 340^\circ$   
 d)  $\cos 300^\circ = \sin 150^\circ$

9. Determine the measure of the missing side in each.

$\cos 60^\circ = \frac{14}{x}$   
 $\frac{1}{2} = \frac{14}{x}$   
 $x = 28$

$\sin 45^\circ = \frac{10}{x}$   
 $\frac{\sqrt{2}}{2} = \frac{10}{x}$   
 $x = 10\sqrt{2}$

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