

**MATH. 125, QUIZ 4 - Section 4.1 & 4.2** (25points = 5% final grade) -  
**NO CALCULATOR ALLOWED** - Fall 2009

1. (1 point each) Convert each angle below from degrees to radians, express your answer in terms of  $\pi$

(a)  $75^\circ = \frac{75\pi}{180} = \frac{5\pi}{12}$

(b)  $20^\circ = \frac{20\pi}{180} = \frac{\pi}{9}$

(c)  $-240^\circ = -\frac{240\pi}{180} = -\frac{4\pi}{3}$

2. (1 point each) Convert each angle below from radians to degrees

(a)  $-2\pi = 360^\circ$

(b)  $\frac{\pi}{5} = 36^\circ$

(c)  $-\frac{3\pi}{2} = \frac{3 \times 180}{2} = -270^\circ$

3. (2 points each) The minute hand of a clock which is 7 inches long moves from 2 o'clock to 5 o'clock. Show your work, circle the final answer.

- (a) Through how many degrees does it move?

Solution: The hand moves  $\frac{3}{12} = \frac{1}{4}$  of a complete revolution, so it moves by  $\frac{360^\circ}{4} = \boxed{90^\circ}$

- (b) How far does the tip of the hand move? Express your answer in terms of  $\pi$ .

Solution:  $s = \frac{2\pi}{4} \times 7$  inches =  $\boxed{\frac{7\pi}{2}}$  inches

- (c) How fast does the tip of the hand move (in inches per minute)? Express your answer in terms of  $\pi$ .

Solution:  $v = \frac{s}{t} = \frac{7\pi}{2}$  inches / 15 minutes =  $\boxed{\frac{7\pi}{30} \frac{\text{inch}}{\text{minute}}}$

4. (5 points each) **Show your work - write down the computations you performed and simplify - no credit for just writing down the final answer! It is assumed that you remember the values of sin, cos, and tan of the following angles:  $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}$  anything more you have to show your work.** Find the exact value of

(a)  $\tan \frac{15\pi}{4} = \tan \left(4\pi - \frac{\pi}{4}\right) = -\tan \frac{\pi}{4} = -1$

(b)  $\sin(-270^\circ) = -\sin 270^\circ = \sin 90^\circ = 1$

(c)  $\cos 45^\circ + \sin 45^\circ = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} = \sqrt{2}$