1)a) 908°   ___188°_____   b) - 45°   _____315°_____
2) a) 30°   __30°+360*x where x is an integer, 390°, 750°,1110°
b) 60°   __60°+360*x where x is an integer _420°,780°,1140°___
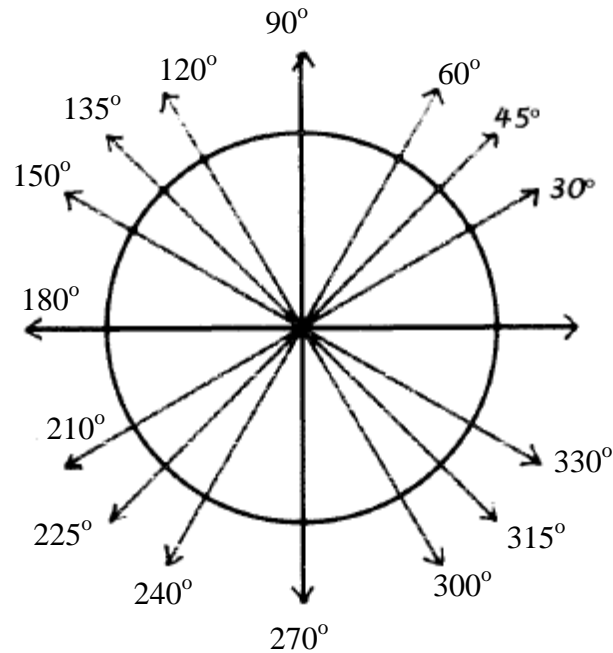
3)____45*360°=16,200°_____
4)   12 mile/h * 1/60 h/min= 1/5 mile/min*5280 ft/mile*12 in/ft =
       12,672 in/min. *1/22π rev/in = 576/π rev/min=183.35 rev/min___
5) _____10°33′36″_____
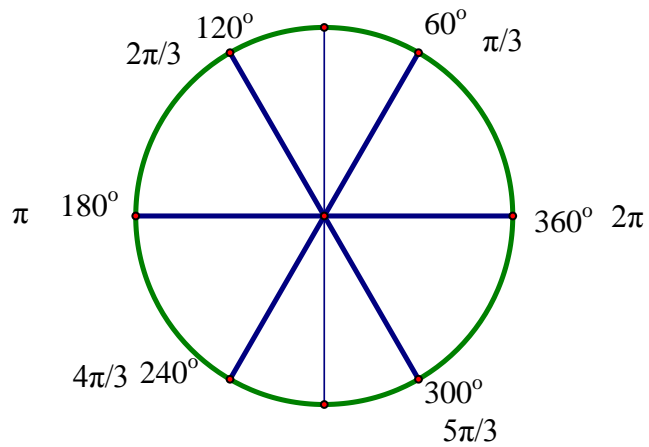5)___3.75ʳ or 1.19πʳ_____
6)_83.08° 83°5′_____
7) Convert to degrees (use the fact that π radians = 180°):

$$\frac{\pi}{6} = \underline{\quad 30° \quad} \qquad \frac{\pi}{4} = \underline{\quad 45° \quad} \qquad \frac{\pi}{3} = \underline{\quad 60° \quad}$$
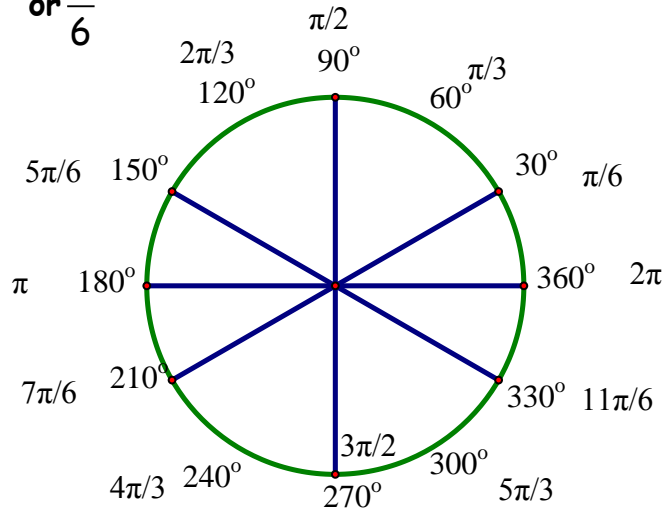
QUADRANTAL ANGLES and

MULTIPLES OF 45° or $\dfrac{\pi}{4}$

1
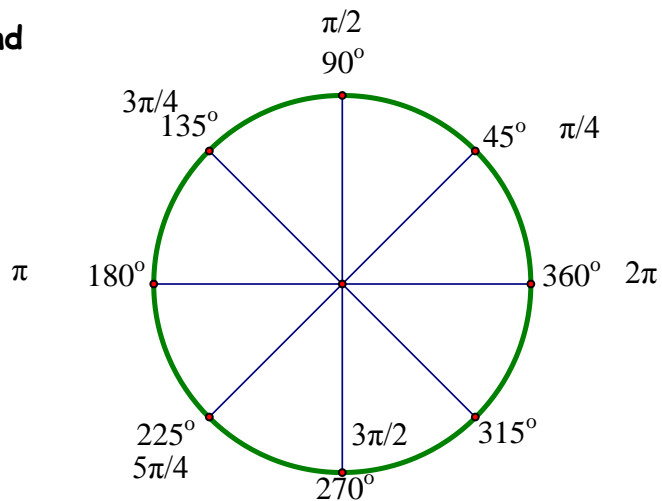
MULTIPLES OF 60° or $\frac{\pi}{3}$

OTHER MULTIPLES OF 30° or $\frac{\pi}{6}$

Special Angles

	Radians	
Degrees	Exact	Approximate
0°	0	0
30°	$\pi/6$	.52
45°	$\frac{\pi}{4}$	.79
60°	$\frac{\pi}{3}$	1.05

Quadrantal Angles

	Radians	
Degrees	Exact	Approximate
90°	$\pi/2$	1.57
180°	π	3.14
270°	$\frac{3\pi}{2}$	4.71
360°	2π	6.28

8) 3 counterclockwise rotations; $\theta = \dfrac{\pi}{3}$.   ____ $19\pi/3$ ____

9) 4 counterclockwise rotations; $\theta = \dfrac{\pi}{6}$ ____ $49\pi/6$ ____

10)   ____ $9\pi/4$ ____ $-7\pi/4$ ____

2

1) If an angle measures 15°, its complement measures ____75°_____ and its supplement _____165°_____.

2) If an angle measures x degrees, how can we represent its complement? ___90°-x_____ and its supplement?_____ 180°-x _____

3) 320°   4) 179°   5)   235°   6) 280°

7) 135°+ 360*n   8) 270°+ 360*n   9) -90°+ 360*n

ON ALL: WHERE N IS AN INTEGER

495°, 855°   630°,-90°   -450°, 630°

10) Which two of the following are not coterminal with r°?

a) 360° + r°   (b) r°-360°   (c) 360°- r°X   (d) r°+ 180°X

11) 75°
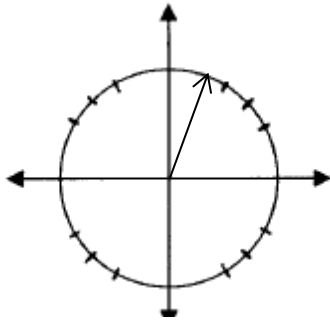
c) _____I_____

d) _____435°,-285°_____

12) -215°
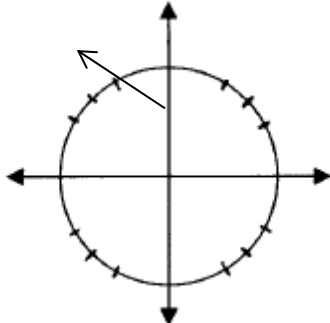
c) _____II_____

d) _____-575°, 145°_____

17) 330°
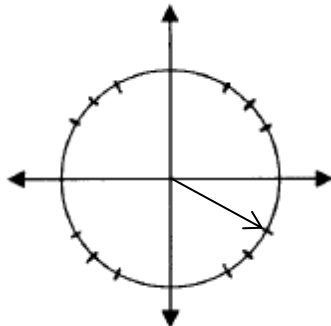
c) _____IV_____

e) ___690°, -30°_____

18) 600 rev/min * 1/60 min/sec=10 rev/sec * 360 deg/sec => 3,600 deg/sec*.5 sec= 1,800 deg

19) 75 deg/min * 60 min/hr = 4,500 deg/hr * 1/360 rev/deg = 12.5 rev/hr

20) Convert each degree measure to radians. Leave answers as multiples of π.

$5\pi/6$ $7\pi/6$ $5\pi/3$

3

a) 120° $2\pi/3$ b) 150° c) 210° d) 300°
e) 450° f) 480° g) 20° h) 80°
$5\pi/2$ $8\pi/3$ $\pi/9$ $4\pi/9$

21) Convert each radian measure to degrees.

a) $\dfrac{\pi}{3}$ $60°$ b) $\dfrac{8\pi}{3}$ $480°$ c) $\dfrac{7\pi}{4}$ $315°$

d) $\dfrac{2\pi}{3}$ $120°$ e) $\dfrac{11\pi}{6}$ $330°$ f) $\dfrac{15\pi}{4}$ $675°$

g) $-\dfrac{\pi}{6}$ $-30°$ h) $-\dfrac{\pi}{4}$ $-45°$ i) $\dfrac{8\pi}{5}$ $288°$

j) $\dfrac{7\pi}{10}$ $126°$ k) $\dfrac{\pi}{12}$ $15°$ l) $\dfrac{5\pi}{12}$ $75°$

22) A circular pulley is rotating about its center. Through how many radians would it turn in (a) 8 rotations? (b) 30 rotations?
$16\pi, 60\pi$

23) Through how many radians will the hour hand on a clock rotate in
   a) 24 hours; 4π
   b) 4 hours? $\frac{2\pi}{3}$

24) A space vehicle is orbiting the earth in a circular orbit. What radian measure corresponds to
   a) 2.5 orbits, and 5π
   b) $\dfrac{4}{3}$ of an orbit? $\frac{8\pi}{3}$

4