AFM Study Guide for Circular Trig Test Name Key

I. Find the radian measure that corresponds to the given degree or radian measure. (Be exact!)

1. 70° $7\pi/18$ 2. -240° $-4\pi/3$ 3. $\frac{-\pi}{3}$ radians $-60°$ 4. 1.2 radians $68.75°$

II. Find the reference angle for the following measures AND give the quadrant of the original angle.

5. 24° $24°$; 1st 5. −330° $30°$; 1st 7. 750° $30°$; 1st 8. $\frac{7\pi}{3}$ $\frac{\pi}{3}$; 1st 9. $\frac{11\pi}{6}$ $\frac{\pi}{6}$; 4th 10. $\frac{6\pi}{5}$ $\frac{\pi}{5}$; 3rd

III. Find the following from the given information.

11. Find the length of an arc of a circle of radius 8 m if the arc subtends a central angle of 40^0. $5.58m$

12. Find the measure of a central angle θ (in radians and degrees) in a circle of radius 5 ft if the arc length is 7 ft. $\frac{7}{5}$ rad $80.2°$ $7=5\theta$ θ

13. A circular arc of length 100 ft subtends a central angle of 70°. Find the radius of the circle. $100 = \left(\frac{70\pi}{180}\right)r$ $r = 81.85$ ft

14. The propeller on a wind generator turns 10.3 revolutions per minute. Express this angular speed in radians per minute. $\frac{10.3\text{rev}}{\text{min}} \cdot \frac{2\pi\text{rad}}{1\text{rev}} = 20.6\pi$ rad/min $= 64.72$ rad/min

15. The propeller of an airplane has a radius of 3 ft. The propeller is rotating at 2250 revolutions per minute. Find the linear speed, in ft per minute, of the tip of the propeller. $2250\frac{\text{rev}}{\text{min}} \cdot \frac{2\pi\text{rad}}{\text{min}} \cdot 3\text{ft} = 42411.5$ ft/min

IV. Find the exact values of the following.

16. $\sin 315°$ $-\sqrt{2}/2$ 17. $\tan(-135°)$ 1 18. $\cos\frac{5\pi}{6}$ $-\sqrt{3}/2$ 19. $\sin 405°$ $\sqrt{2}/2$ 20. $\cos\frac{-22\pi}{3}$ $\frac{2\pi}{3}$ $-\frac{1}{2}$ 21. $\tan 4\pi$ 0 22. $\sec -\frac{5\pi}{6}$ cos $-\frac{2\sqrt{3}}{3}$

23. $\cos 225$ $-\frac{\sqrt{2}}{2}$ 24. $\tan 210$ 30° $\sqrt{3}/3$ 25. $\cot 420$ 60° $\sqrt{3}/3$ 26. $\sin\frac{2\pi}{3}$ $\frac{\sqrt{3}}{2}$ 27. $\csc\frac{7\pi}{6}$ sin -2 28. $\tan\frac{9\pi}{4}$ 1 29. $\cos\pi$ -1

V. Find the value of the SIX trigonometric functions of θ from the information given.

30. $\tan\theta = 4$, $\sin\theta < 0$ $x=1$ $y=4$ $r=\sqrt{17}$ $\sin\theta = -4\sqrt{17}/17$ $\cos\theta = -\sqrt{17}/17$ $\tan\theta = 4$

31. $\sin\theta = -3/4$ and $\cos\theta > 0$ $y=-3$ $r=4$ $x=\sqrt{7}$ $\sin\theta = -\frac{3}{4}$ $\cos\theta = \frac{\sqrt{7}}{4}$ $\tan\theta = -\frac{3\sqrt{7}}{7}$

VI. Terminal points. $r=\sqrt{26}$

32. If (-1, -5) is a point on the terminal side of angle θ, find the exact value of each of the six trig functions.

$\sin\theta = \frac{-5}{\sqrt{26}} = -\frac{5\sqrt{26}}{26}$ $\cos\theta = -\frac{\sqrt{26}}{26}$ $\tan\theta = 5$

VII. Find the quadrant in which θ lies from the information given.

34. $\sin\theta < 0$, $\cos\theta > 0$ 4 35. $\tan\theta > 0$, $\sin\theta < 0$ 3

VIII. Graphs. For #36 – 39, state the amplitude, period, phase shift, and vertical shift.

36. $y = 3\sin\frac{1}{4}(x+\pi) - 3$ Amp = 3 per = 8π P.S. left π V.S down 3

37. $y = -2\cos x - 1$ PSO Amp = 1 per = $2\pi/3$ Amp = 2 per = 2π vs down 1

38. $y = \cos(3x - 2\pi)$ p.s = rt $2\pi/3$ vs 0

39. $y = -\frac{1}{2}\sin(2x + \frac{\pi}{2}) + 4$ Amp = $\frac{1}{2}$ vs up 4 per = π p.s = left $\frac{\pi}{4}$

40. A Ferris wheel has a diameter of 20 m and the bottom of the wheel passes 1 m above the ground. If the Ferris wheel makes one complete revolution every 20 seconds, find both a sine and cosine equation that gives the height above the ground of a person on the Ferris wheel as a function of time. Let t = 0 be when the person gets on the Ferris wheel at its lowest point.

$y = -10\cos\frac{\pi}{10}t + 11$

$y = 10\sin\frac{\pi}{10}(t-5) + 11$