

AFM Unit 2 Study Guide

Name Key

Determine the quadrant each angle lies in.



1. $-\frac{7\pi}{4}$ 2. $\frac{8\pi}{3}$ 3. -447° 4. 623° 5. $\frac{23\pi}{6}$
- I II IV III IV

Change each degree to radian measure. (exact value only)

6. $220^\circ \left(\frac{\pi}{180}\right) = \frac{11\pi}{9}$ 7. $-442^\circ \left(\frac{\pi}{180}\right) = -\frac{221\pi}{90}$ 8. $124^\circ \left(\frac{\pi}{180}\right) = \frac{31\pi}{45}$
9. $-450^\circ \left(\frac{\pi}{180}\right) = -5\pi/2$ 10. $15^\circ \left(\frac{\pi}{180}\right) = \pi/12$

Change each radian to degrees. Exact answers only.

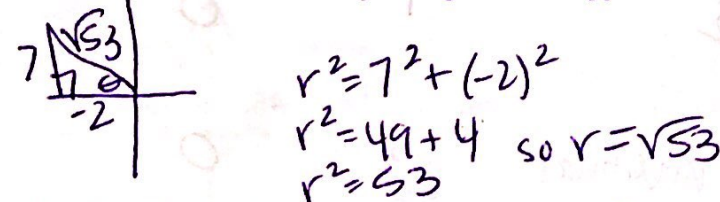
11. $-\frac{11\pi}{7} \left(\frac{180}{\pi}\right) = -\frac{1980}{7}^\circ$ 12. $\frac{9\pi}{4} \left(\frac{180}{\pi}\right) = 405^\circ$ 13. $-5 \left(\frac{180}{\pi}\right) = -\frac{900}{\pi}^\circ$ 14. $\frac{17\pi}{18} \left(\frac{180}{\pi}\right) = 170^\circ$

Find a positive and negative co-terminal angle for each given angle. Keep units the same.

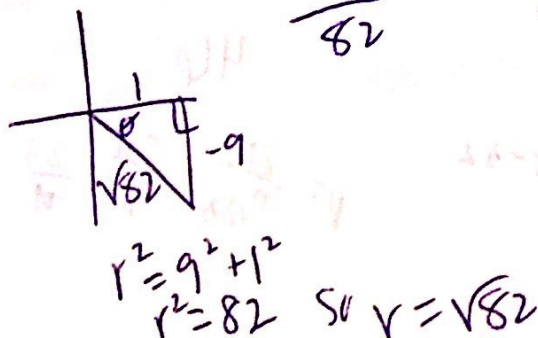
15. $\frac{17\pi}{6} \pm \frac{12\pi}{6}$ 16. $-108^\circ \pm 360^\circ$
- $\frac{29\pi}{6}, \frac{5\pi}{6}, -\frac{7\pi}{6}$ $-468^\circ, 252^\circ, 612^\circ$

Find the values of each given the point on the terminal side of θ . Draw a reference triangle.

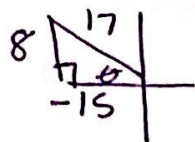
25. $(-2, 7)$ $\sin\theta = \frac{7}{\sqrt{53}} = \frac{7\sqrt{53}}{53}$ $\cos\theta = \frac{-2}{\sqrt{53}} = \frac{-2\sqrt{53}}{53}$ $\tan\theta = -7/2$



26. $(1, -9)$ $\sin\theta = \frac{-9}{\sqrt{82}}$ $\cos\theta = \frac{1}{\sqrt{82}}$ $\tan\theta = -9$



27. If θ lies in quadrant II, and $\sin\theta = \frac{8}{17}$, then $\tan\theta = \underline{-8/15}$ and $\cos\theta = \underline{-15/17}$



$$17^2 = 8^2 + x^2$$

$$225 = x^2$$

28. Determine the quadrant(s) where θ would lie: S/A
T/C

a. $\cos\theta > 0$ and $\tan\theta < 0$ IV
1, 4 2, 4

b. $\sin\theta$ and $\tan\theta$ are opposite signs II, III
one pos + one neg

c. $\sin\theta < 0$ and $\tan\theta > 0$ III
3, 4 1, 3

29. Find the arc length of a circle given the central angle is 1.5 radians and the radius is 7 cm.

$$S = 2\pi(7) \left(\frac{1.5}{2\pi}\right)$$

$$S = 7(1.5) = 10.5 \text{ cm}$$

30. An arc has a measure of 6 cm intercepts a central angle of 75° . Find the radius of the circle. Round to two decimal places.

$$6 = 2\pi r \left(\frac{75}{360}\right) \rightarrow 6 = \frac{150\pi r}{360}$$

$$4.58 = r$$

31. Find the area of a sector if its central angle is 35° and the radius of the circle is 12.4 cm. Round to two decimal places.

$$A = \pi(12.4)^2 \left(\frac{35}{360}\right)$$

$$A = 46.96 \text{ cm}^2$$

Use a calculator and round to FOUR places. Beware of MODE.

32. $\sin(314^\circ)$
- .7193

33. $\tan(-85.3^\circ)$
-12.1632

34. $\cos\left(-\frac{3\pi}{8}\right)$
.3827

35. $\tan\left(\frac{23}{25}\right)$
1.3133

Evaluate using exact values only. No calculator! (use your unit circle)

36. $\tan 180^\circ$
 $\frac{0}{1} = 0$

37. $\cos 315^\circ$
 $\frac{\sqrt{2}}{2}$

38. $\sin 150^\circ$
 $\frac{1}{2}$

39. $\tan 135^\circ$
-1

40. $\sin 0^\circ$
0

41. $\cos \frac{2\pi}{3}$
 $-\frac{1}{2}$

42. $\sin\left(-\frac{7\pi}{4}\right)$
 $\frac{\sqrt{2}}{2}$

43. $\tan \frac{3\pi}{2}$
 $\frac{1}{0} = \text{undefined}$

44. $\cos \frac{11\pi}{6}$
 $\frac{\sqrt{3}}{2}$

45. $\sin 3\pi$
0

46. Given $h(t) = -32\cos \frac{\pi}{23}t + 48$
80 = max height

16 = min height

46 = period

$$48 + 32$$

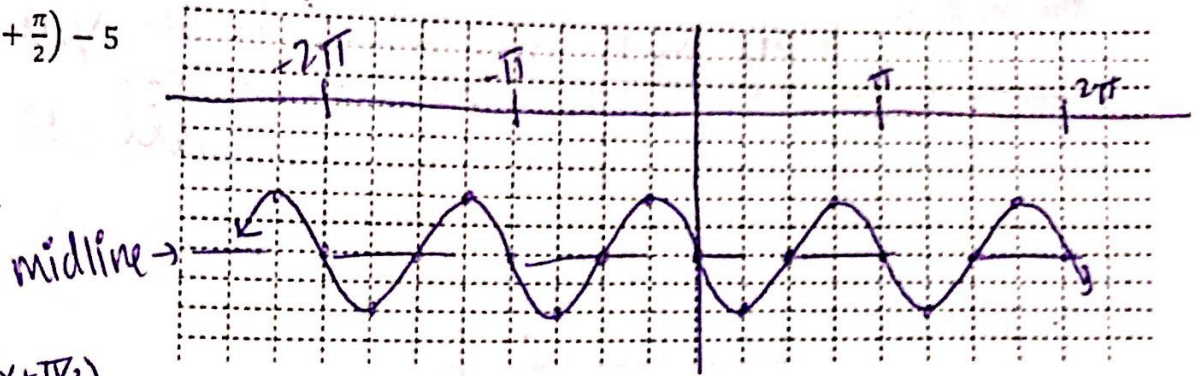
$$48 - 32$$

$$P = \frac{2\pi}{\pi/23} = \frac{2\pi}{1} \cdot \frac{23}{\pi}$$

Graph the following functions. Label the axes!

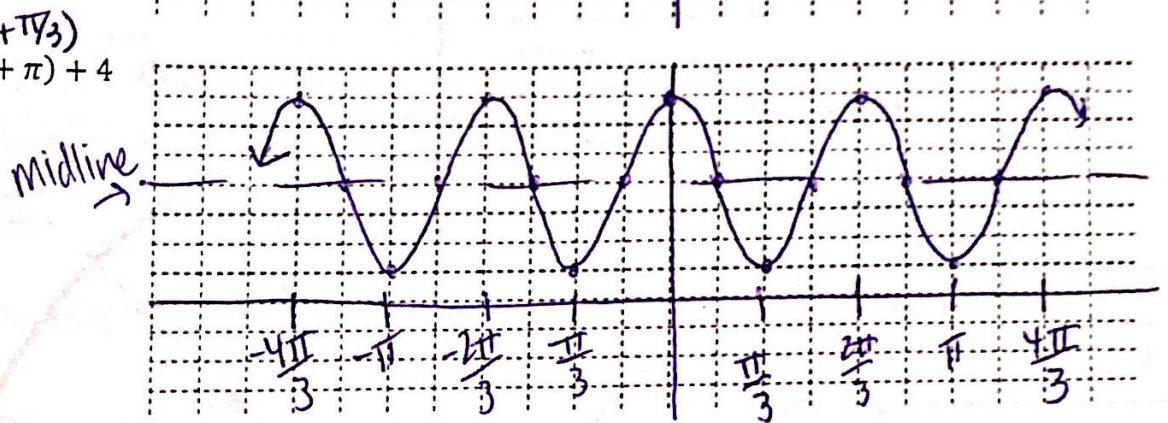
47. $y = 2\sin 2\left(x + \frac{\pi}{2}\right) - 5$

a: $\frac{2}{}$
 p: $\frac{\pi}{}$
 vs: $\downarrow 5$
 ps: $\text{Left } \frac{\pi}{2}$



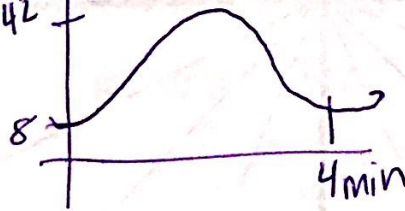
48. $y = -3\cos(3(x + \frac{\pi}{3})) + 4$

a: $\frac{3}{}$
 p: $\frac{2\pi}{3}$
 vs: $\uparrow 4$
 ps: $\text{Left } \frac{\pi}{3}$



49. A Ferris wheel with a radius of 17 feet is rotating at a rate of 4 revolutions per minute. The bottom chair is 8 feet above the ground. Write a model for the height of a person above the ground whose height when $t = 0$ is the minimum.

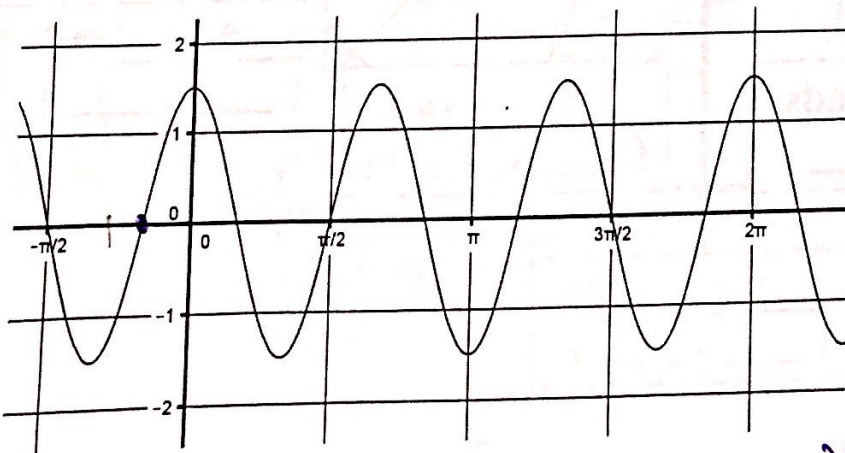
$p = 4 \text{ revs/min}$
 $a = \frac{1}{2}(42 - 8) = 17$
 $b = \frac{2\pi}{15} - \frac{2\pi}{15}$
 $\rightarrow 1 \text{ rev} / 15 \text{ sec}$



$$y = -17\cos\left(\frac{2\pi}{15}x\right) + 25$$

\uparrow
min + amp

50. Write a sine and cosine equation for the following graph.



$a = 1.5$
 $p = \frac{2\pi}{3}$
 vs: none
 $b = \frac{2\pi}{1} \cdot \frac{3}{2\pi} = 3$

$y = 1.5\cos(3x)$
 or
 $y = 1.5\sin\left(3\left(x + \frac{\pi}{6}\right)\right)$