Math 1060 Test 1 Review

Find the value by drawing a reference angle (and a reference triangle when possible):

1. $\sin 30^\circ$ **2.** $\csc 120^\circ$ **3.** $\tan 315^\circ$ **4.** $\sec \frac{5\pi}{4}$

5. $\cot \frac{4\pi}{3}$ **6.** $\cos \pi$ **7.** $\tan \frac{\pi}{2}$ **8.** $\sec 270^\circ$

9. $\sin \frac{10\pi}{3}$ **10.** $\cot \frac{5\pi}{6}$ **11.** $\cos 8\pi$ **12.** $\csc 450^\circ$

13. If $\cos \theta = \frac{1}{2}$, and $\sin \theta < 0$, find the value of θ in degrees and the remaining trig functions.

14. If $\sin \theta = \frac{-1}{\sqrt{2}}$, and $\cos \theta < 0$, find the value of θ in radians and the remaining trig functions.

15. Convert from radians to degrees.

a. $\frac{5\pi}{3}$ **b.** $\frac{-7\pi}{5}$ **c.** $\frac{11\pi}{9}$

16. Convert from degrees to radians.

a. 320° **b.** -120° **c.** 500°

17. Graph $y = \sin x$ **18.** Graph $y = \cos x$ **19.** Graph $y = \tan x$

20. Find one positive coterminal angle and one negative coterminal angle.

a. 340° **b.** $\frac{7\pi}{3}$ **c.** $\frac{-8\pi}{5}$

21. Find the exact value for each. (Express each answer in **radians**).

a. $\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)$ **b.** $\cos^{-1}(0)$ **c.** $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$

d. $\cos^{-1}\left(\frac{-1}{\sqrt{2}}\right)$ **e.** $\cot^{-1}(-1)$ **f.** $\csc^{-1}(-1)$

22. For each problem: Find the amplitude and period. Describe the other adjustments to the graph. <u>You do not need to graph</u>.

a. $y = -2\sin \pi\left(x + \frac{\pi}{2}\right)$ **b.** $y = 4\tan\left(\frac{1}{2}x\right) + 3$ **c.** $y = \cos(3x - \pi) + 1$

23. Graph.

a. $y = \frac{1}{2}\sin x + 3$ **b.** $y = -\tan\left(\frac{1}{2}x\right)$ **c.** $y = \csc(2x + \pi)$

d. $y = -\cos\left(\frac{1}{2}x + \frac{\pi}{2}\right)$ **e.** $y = 2\sec x + 1$ **f.** $y = 3\cot\left(\frac{\pi}{2}x\right)$

24. If $\cos\theta = \frac{-3}{7}$ and $\tan\theta > 0$ find the remaining trig functions

25. a. The terminal side of an angle passes through the point (5, −8). Find all 6 trig functions for the angle.

b. The terminal side of an angle passes through the point (−5, −12). Find all 6 trig functions for the angle

<u>Round all answers to 2 places after the decimal. Be sure that your calculator is in the correct mode.</u>

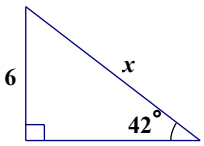
26. Calculate: **a.** $\sin 317^\circ$ **b.** $\csc(-512)^\circ$ **c.** $\tan\frac{7\pi}{5}$ **d.** $\sec\frac{4\pi}{7}$

27. Find each of the following in **radians**.

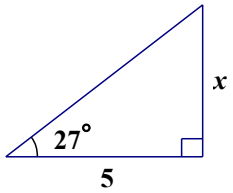
a. $\cos^{-1}(0.0561)$ **b.** $\sin^{-1}(1.368)$ **c.** $\tan^{-1}(-1.456)$ **d.** $\csc^{-1}(-1.589)$

28. a. Convert the angle 32°20'30" to a decimal in degrees. **b.** Convert the angle 63.18° to D°M'S" form.

29. Find ***x***.



30. Find ***x***.



31. Draw pictures and solve:

a. You are standing on top of a 80 foot tower. The angle of **depression** to a bulls-eye on the ground is 23°. How long will your zip-line from the tower to the bulls-eye be?

b. You are standing 100 feet from the base of a tree. The angle of **elevation** from you to the top of the tree is 37°. How tall is the tree?

c. From a hot air balloon 500 feet above ground you see a lake below. The angle of depression to one end of the lake is 25°. The angle of depression to the other end of the lake is 65°. How long is the lake? (Remember angle of elevation = angle of depression).

32. Find the exact solution $-3\sin^{-1}x = \pi$

33. Find the exact value of $\tan\left[\sin^{-1}\left(\frac{-4}{5}\right)\right]$

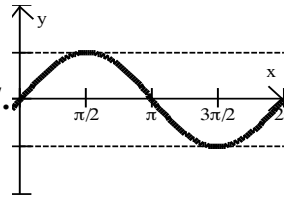
Answers:

1. $\frac{1}{2}$ **2.** $\frac{2}{\sqrt{3}}$ **3.** -1 **4.** $-\sqrt{2}$ **5.** $\frac{1}{\sqrt{3}}$ **6.** -1 **7.** undef. **8.** undef. **9.** $\frac{-\sqrt{3}}{2}$

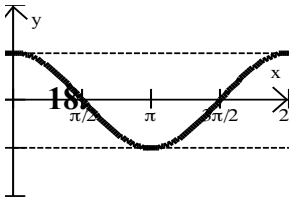
10. $-\sqrt{3}$ **11.** 1 **12.** 1 **13.** 300° $\sin\theta = \frac{-\sqrt{3}}{2}$ $\tan\theta = -\sqrt{3}$ $\csc\theta = \frac{-2}{\sqrt{3}}$ $\sec\theta = 2$ $\cot\theta = \frac{-1}{\sqrt{3}}$

14. $\frac{5\pi}{4}$ $\cos\theta = \frac{-1}{\sqrt{2}}$ $\tan\theta = 1$ $\csc\theta = -\sqrt{2}$ $\sec\theta = -\sqrt{2}$ $\cot\theta = 1$ **15. a.** 300° **b.** -252° **c.** 220°

16a. $\frac{16\pi}{9}$ **b.** $\frac{-2\pi}{3}$ **c.** $\frac{25\pi}{9}$ **17.**



18.



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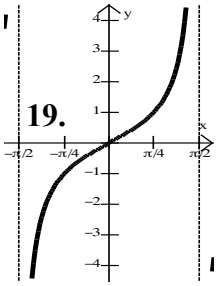
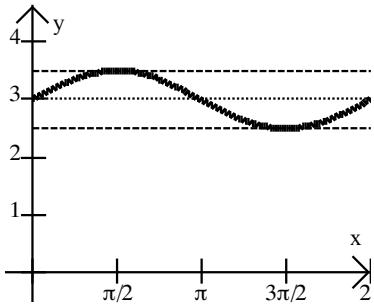


20a. 700° -20° **b.** $\frac{13\pi}{3}, \frac{-5\pi}{3}$ **c.** $\frac{2\pi}{5}, \frac{-18\pi}{5}$ **21. a.** $\frac{-\pi}{3}$ **b.** $\frac{\pi}{2}$ **c.** $\frac{\pi}{6}$ **d.** $\frac{3\pi}{4}$ **e.** $\frac{3\pi}{4}$ **f.** $\frac{-\pi}{2}$

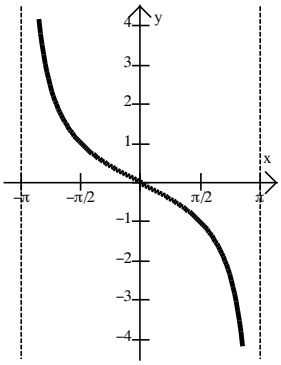
22a. a = 2 p = 2, reflected, shift to the left $\frac{\pi}{2}$ **22b.** no amp. p = 2π , shift up 3, stretch by 4

22c. a = 1 p = $\frac{2\pi}{3}$, shift right $\frac{\pi}{3}$, up 1

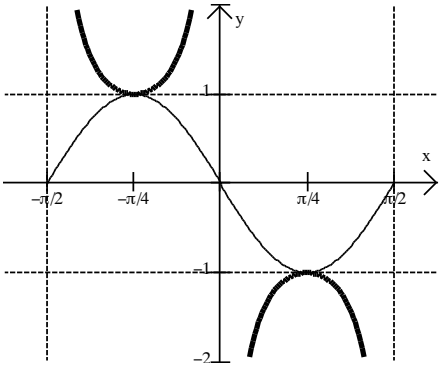
23a.



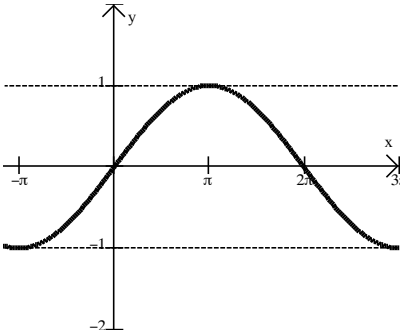
b.



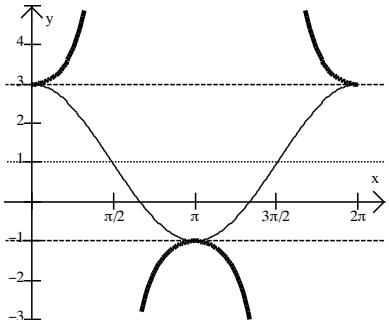
c.



d.



e.



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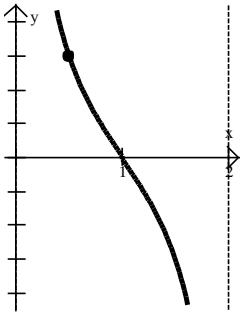


24. $\sin\theta = \dfrac{-2\sqrt{10}}{7}$ $\tan\theta = \dfrac{2\sqrt{10}}{3}$ $\csc\theta = \dfrac{-7}{2\sqrt{10}}$

$\sec\theta = \dfrac{-7}{3}$ $\cot\theta = \dfrac{3}{2\sqrt{10}}$

25a. $\sin\theta = \dfrac{-8}{\sqrt{89}}$ $\cos\theta = \dfrac{5}{\sqrt{89}}$ $\tan\theta = \dfrac{-8}{5}$

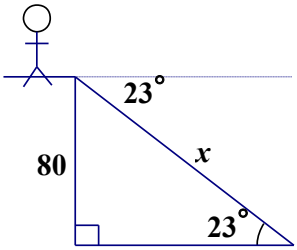
$\csc\theta = \dfrac{-\sqrt{89}}{8}$ $\sec\theta = \dfrac{\sqrt{89}}{5}$ $\cot\theta = \dfrac{-5}{8}$

25 b. $\sin\theta = \dfrac{-12}{13}$ $\cos\theta = \dfrac{-5}{13}$ $\tan\theta = \dfrac{12}{5}$ $\csc\theta = \dfrac{-13}{12}$ $\sec\theta = \dfrac{-13}{5}$ $\cot\theta = \dfrac{5}{12}$

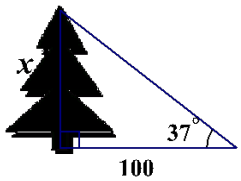
26. a. −.68 **b**. −2.13 **c.** 3.08 **d.** −4.49 **27. a.** 1.52 **b.** not possible **c.** −0.97 **d.** −.68

28. a. 32.342° **b.** 63°10'45" **29.** 8.97 **30.** 2.55

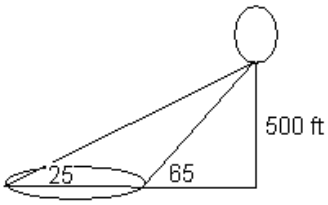
31a. x = 204.74 feet



31b. x = 75.36 feet



31c. 839.1 ft



32. $x = \sin\dfrac{\pi}{3} = \dfrac{\sqrt{3}}{2}$

33. $\dfrac{-4}{3}$