



# Review Questions

for

# MATH 114

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## Review Questions for Math 111, Part 4

Two sides of a right triangle ABC (C is the right angle) are given. Find the indicated trigonometric function of the given angle. Give exact answers with rational denominators.

1) Find  $\cos A$  when  $a = \sqrt{3}$  and  $c = 15$  1) \_\_\_\_\_  
 A)  $\frac{\sqrt{222}}{15}$                       B)  $\frac{\sqrt{3}}{15}$                       C)  $\frac{74}{15}$                       D)  $\frac{1}{5}$

2) Find  $\csc B$  when  $a = 5$  and  $b = 2$ . 2) \_\_\_\_\_  
 A)  $\frac{5\sqrt{29}}{29}$                       B)  $\frac{\sqrt{29}}{2}$                       C)  $\frac{\sqrt{29}}{5}$                       D)  $\frac{2\sqrt{29}}{29}$

3) Find  $\tan B$  when  $a = 7$  and  $b = 4$ . 3) \_\_\_\_\_  
 A)  $\frac{4}{7}$                       B)  $\frac{7\sqrt{65}}{65}$                       C)  $\frac{7}{4}$                       D)  $\frac{4\sqrt{65}}{65}$

Use identities to find the exact value of the indicated trigonometric function of the acute angle  $\theta$ .

4)  $\sin \theta = \frac{\sqrt{5}}{3}$ ,  $\cos \theta = \frac{2}{3}$ . Find  $\sec \theta$ . 4) \_\_\_\_\_  
 A)  $\frac{\sqrt{5}}{2}$                       B)  $\frac{2\sqrt{5}}{5}$                       C)  $\frac{3}{2}$                       D)  $\frac{3\sqrt{5}}{5}$

Use the definition or identities to find the exact value of the indicated trigonometric function of the acute angle  $\theta$ .

5)  $\cos \theta = \frac{5}{13}$  Find  $\cot \theta$ . 5) \_\_\_\_\_  
 A)  $\frac{13}{5}$                       B)  $\frac{13}{12}$                       C)  $\frac{5}{12}$                       D)  $\frac{12}{5}$

6)  $\csc \theta = \frac{2\sqrt{3}}{3}$  Find  $\cos \theta$ . 6) \_\_\_\_\_  
 A)  $\frac{\sqrt{3}}{2}$                       B)  $\frac{1}{2}$                       C)  $\frac{\sqrt{3}}{3}$                       D) 2

Use Fundamental Identities and/or the Complementary Angle Theorem to find the exact value of the expression. Do not use a calculator.

7)  $-\frac{\sec 50^\circ}{\csc 40^\circ}$  7) \_\_\_\_\_  
 A) 0                      B) 1                      C) -1                      D) undefined

8)  $\csc^2 20^\circ - \tan^2 70^\circ$  8) \_\_\_\_\_  
 A) 2                      B) 0                      C) -1                      D) 1

## Review Questions for Math 111, Part 4

Solve the problem.

9) Given  $\cos 30^\circ = \frac{\sqrt{3}}{2}$ , use trigonometric identities to find the exact value of  $\sin^2 30^\circ$ . 9) \_\_\_\_\_

- A) 3                      B)  $\frac{1}{4}$                       C) 1                      D)  $\frac{1}{2}$

Find the exact value of the expression if  $\theta = 45^\circ$ . Do not use a calculator.

10)  $\sin \theta$  10) \_\_\_\_\_

- A)  $\sqrt{2}$                       B)  $-\frac{\sqrt{2}}{2}$                       C)  $\frac{1}{2}$                       D)  $\frac{\sqrt{2}}{2}$

11)  $\frac{\sin \theta}{8}$  11) \_\_\_\_\_

- A)  $4\sqrt{2}$                       B)  $16\sqrt{2}$                       C)  $\frac{\sqrt{2}}{8}$                       D)  $\frac{\sqrt{2}}{16}$

Find the exact value of the expression if  $\theta = 30^\circ$ . Do not use a calculator.

12)  $\sin \theta$  12) \_\_\_\_\_

- A)  $\frac{1}{2}$                       B)  $\frac{\sqrt{3}}{3}$                       C)  $\frac{\sqrt{2}}{2}$                       D)  $\frac{\sqrt{3}}{2}$

13)  $5 \cos \theta$  13) \_\_\_\_\_

- A)  $-\frac{1}{2}$                       B)  $-\frac{\sqrt{3}}{2}$                       C)  $\frac{5}{2}$                       D)  $\frac{5\sqrt{3}}{2}$

Find the exact value of the expression if  $\theta = 60^\circ$ . Do not use a calculator.

14)  $\csc \theta$  14) \_\_\_\_\_

- A)  $\sqrt{2}$                       B)  $\frac{\sqrt{3}}{2}$                       C) 2                      D)  $\frac{2\sqrt{3}}{3}$

15)  $10\sin \theta$  15) \_\_\_\_\_

- A)  $-\frac{1}{2}$                       B)  $-\frac{\sqrt{3}}{2}$                       C)  $5\sqrt{3}$                       D) 5

**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

Find the exact value of the expression. Do not use a calculator.

16)  $\sin \frac{\pi}{3} - \cos \frac{\pi}{6}$  16) \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

A point on the terminal side of angle  $\theta$  is given. Find the exact value of the indicated trigonometric function.

17) (7, 9) Find  $\tan \theta$ . 17) \_\_\_\_\_

- A)  $\frac{7}{11}$                       B)  $\frac{9}{11}$                       C)  $\frac{7}{9}$                       D)  $\frac{9}{7}$

## Review Questions for Math 111, Part 4

18)  $(-4, -3)$

Find  $\sec \theta$ .

A)  $\frac{5}{3}$

B)  $-\frac{4}{5}$

C)  $-\frac{5}{4}$

D)  $\frac{3}{4}$

18) \_\_\_\_\_

Use a coterminal angle to find the exact value of the expression. Do not use a calculator.

19)  $\cos \frac{37\pi}{6}$

A)  $-\frac{1}{2}$

B)  $-\frac{\sqrt{3}}{2}$

C)  $\frac{1}{2}$

D)  $\frac{\sqrt{3}}{2}$

19) \_\_\_\_\_

20)  $\cos 780^\circ$

A)  $\frac{1}{2}$

B)  $\frac{\sqrt{3}}{2}$

C) 2

D)  $\frac{2\sqrt{3}}{3}$

20) \_\_\_\_\_

21)  $\tan \frac{13\pi}{3}$

A) 1

B)  $\sqrt{3}$

C)  $\frac{\sqrt{3}}{2}$

D)  $\frac{\sqrt{3}}{3}$

21) \_\_\_\_\_

Name the quadrant in which the angle  $\theta$  lies.

22)  $\cot \theta < 0, \cos \theta > 0$

A) I

B) II

C) III

D) IV

22) \_\_\_\_\_

23)  $\cos \theta > 0, \csc \theta < 0$

A) I

B) II

C) III

D) IV

23) \_\_\_\_\_

Solve the problem.

24) Which of the following trigonometric values are negative?

I.  $\sin(-292^\circ)$

II.  $\tan(-193^\circ)$

III.  $\cos(-207^\circ)$

IV.  $\cot 222^\circ$

A) II, III, and IV

B) I and III

C) II and III

D) III only

24) \_\_\_\_\_

Find the reference angle of the given angle.

25)  $384^\circ$

A)  $66^\circ$

B)  $114^\circ$

C)  $24^\circ$

D)  $156^\circ$

25) \_\_\_\_\_

26)  $-61^\circ$

A)  $151^\circ$

B)  $29^\circ$

C)  $61^\circ$

D)  $119^\circ$

26) \_\_\_\_\_

27)  $\frac{7\pi}{6}$

A)  $\frac{7\pi}{6}$

B)  $\frac{5\pi}{6}$

C)  $\frac{\pi}{6}$

D)  $\frac{\pi}{12}$

27) \_\_\_\_\_

## Review Questions for Math 111, Part 4

28)  $-\frac{5\pi}{4}$

A)  $\frac{\pi}{4}$

B)  $\frac{5\pi}{4}$

C)  $\frac{3\pi}{4}$

D)  $\frac{\pi}{8}$

28) \_\_\_\_\_

**Use the reference angle to find the exact value of the expression. Do not use a calculator.**

29)  $\cot 570^\circ$

A)  $\sqrt{3}$

B)  $-\sqrt{3}$

C)  $\frac{\sqrt{3}}{3}$

D)  $-\frac{\sqrt{3}}{3}$

29) \_\_\_\_\_

30)  $\csc \frac{-2\pi}{3}$

A)  $-\sqrt{3}$

B)  $-\sqrt{2}$

C)  $-\frac{2\sqrt{3}}{3}$

D)  $-\frac{1}{2}$

30) \_\_\_\_\_

**Find the exact value of the indicated trigonometric function of  $\theta$ .**

31)  $\tan \theta = -\frac{10}{9}$ ,  $\theta$  in quadrant II Find  $\cos \theta$ .

A)  $-\frac{9\sqrt{181}}{181}$

B)  $-\frac{\sqrt{181}}{9}$

C)  $\frac{\sqrt{181}}{10}$

D)  $\frac{9\sqrt{181}}{181}$

31) \_\_\_\_\_

32)  $\cos \theta = \frac{15}{17}$ ,  $\frac{3\pi}{2} < \theta < 2\pi$  Find  $\cot \theta$ .

A)  $\frac{17}{15}$

B)  $-\frac{15}{8}$

C)  $-\frac{15\sqrt{2}}{2}$

D)  $-\frac{8}{15}$

32) \_\_\_\_\_

**Solve the problem.**

33) For what numbers  $\theta$  is  $f(\theta) = \tan \theta$  not defined?

A) integral multiples of  $\pi$  ( $180^\circ$ )

B) all real numbers

C) odd multiples of  $\pi$  ( $180^\circ$ )

D) odd multiples of  $\frac{\pi}{2}$  ( $90^\circ$ )

33) \_\_\_\_\_

34) If  $\cot \theta = 3.1$ , find the value of  $\cot \theta + \cot(\theta + \pi) + \cot(\theta + 2\pi)$ .

A) 9.3

B) 11.3

C)  $9.3 + 3\pi$

D) undefined

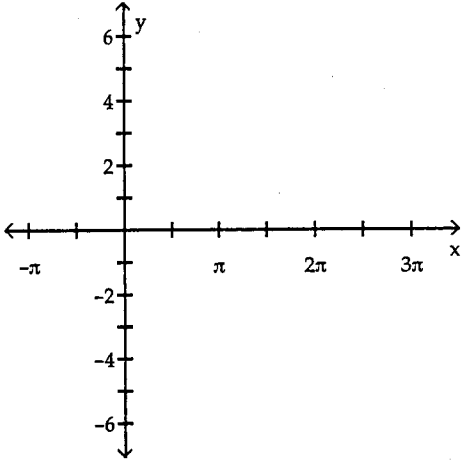
34) \_\_\_\_\_

# Review Questions for Math 111, Part 4

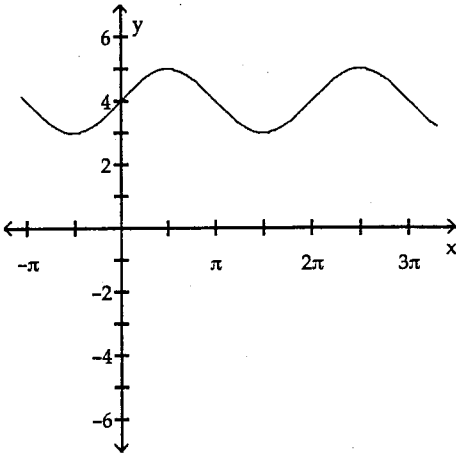
Use transformations to graph the function.

35)  $y = -4 \sin x$

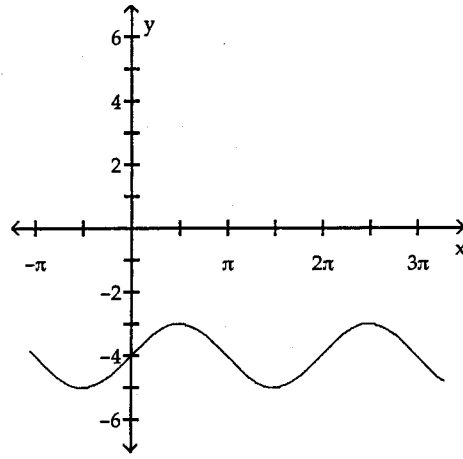
35)



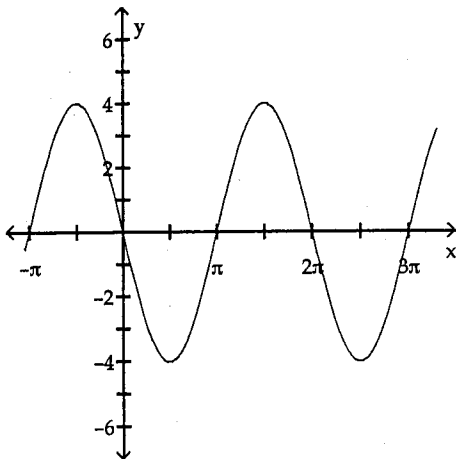
A)



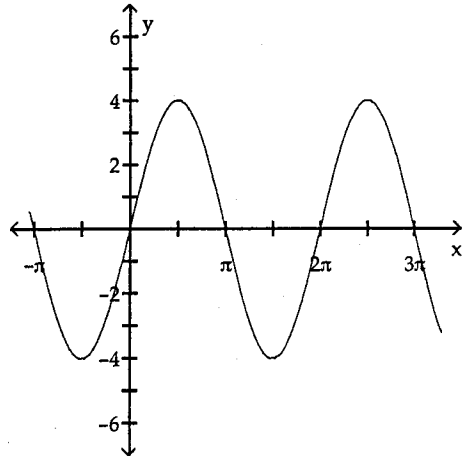
B)



C)



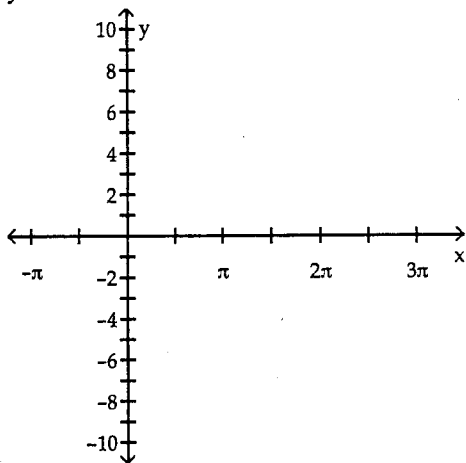
D)



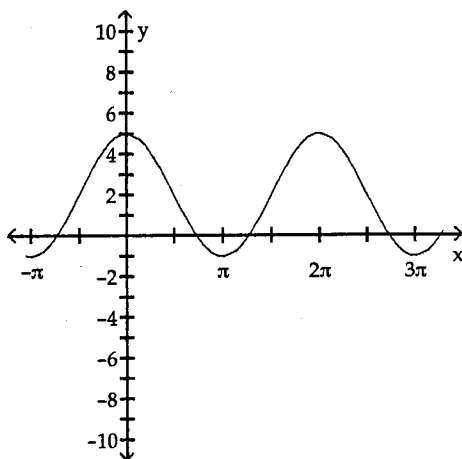
# Review Questions for Math 111, Part 4

36)  $y = 3 \cos x + 2$

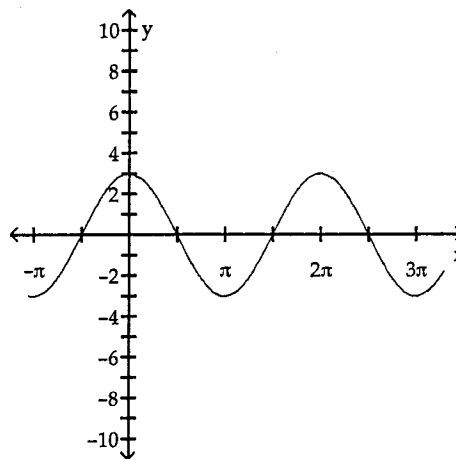
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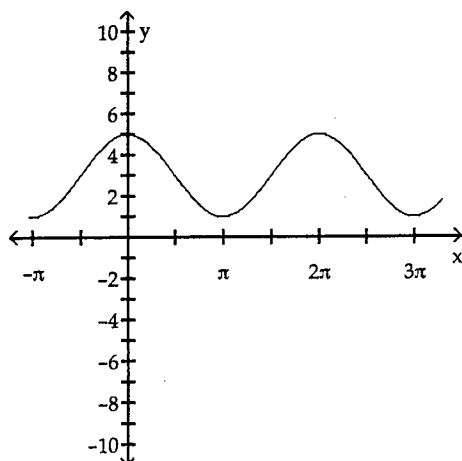
A)



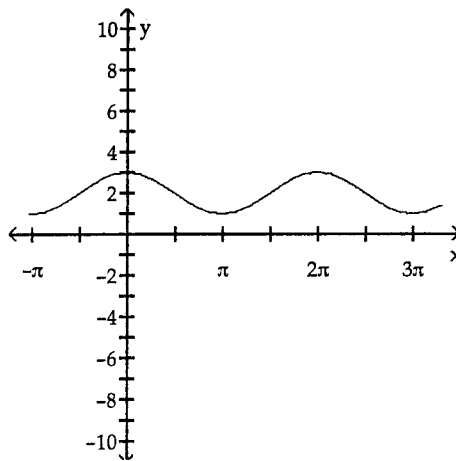
B)



C)



D)



Without graphing the function, determine its amplitude or period as requested.

37)  $y = \sin 5x$  Find the period.

37) \_\_\_\_\_

A) 1

B)  $2\pi$

C)  $\frac{2\pi}{5}$

D) 5

## Review Questions for Math 111, Part 4

38)  $y = \frac{9}{8} \sin\left(-\frac{8\pi}{3}x\right)$  Find the amplitude.

38) \_\_\_\_\_

A)  $\frac{3}{4}$

B)  $\frac{9}{8}$

C)  $\frac{8\pi}{3}$

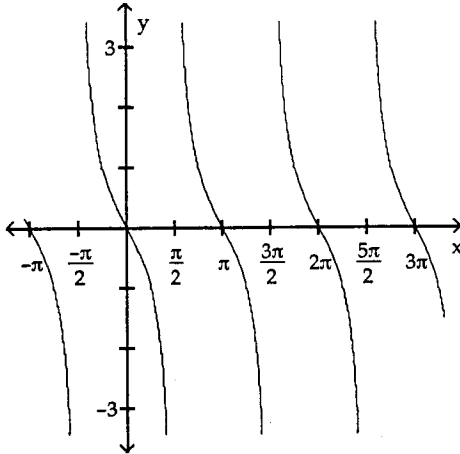
D)  $\frac{8\pi}{9}$

Match the function to its graph.

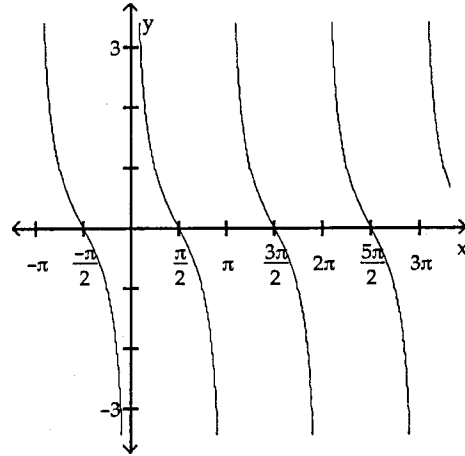
39)  $y = \tan(x + \pi)$

39) \_\_\_\_\_

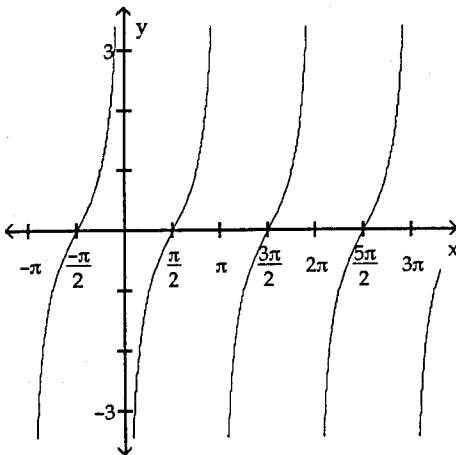
A)



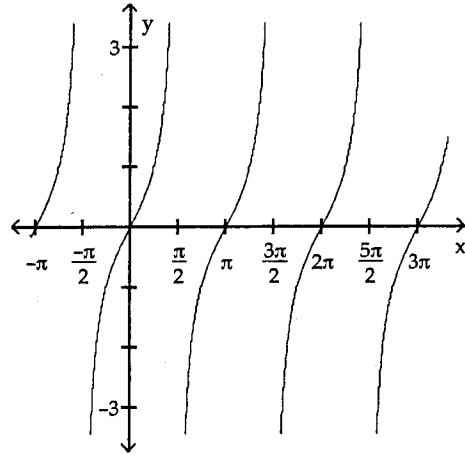
B)



C)



D)



Find the phase shift of the function.

40)  $y = 4 \sin\left(4x - \frac{\pi}{2}\right)$

40) \_\_\_\_\_

A)  $4\pi$  units down

B)  $\frac{\pi}{2}$  units to the left

C)  $\frac{\pi}{8}$  units to the right

D)  $4\pi$  units up

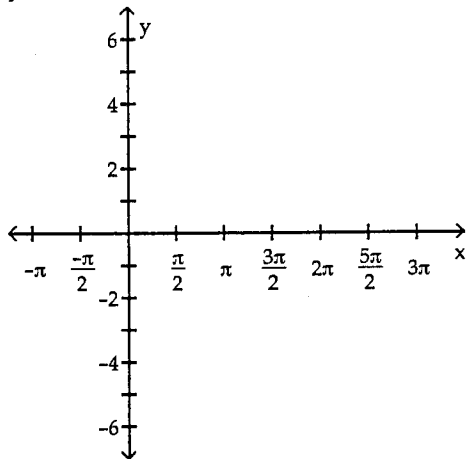


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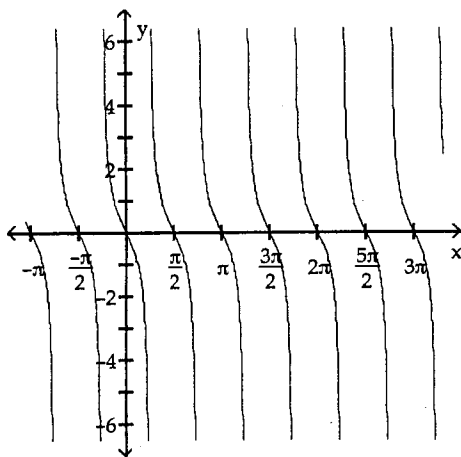
Graph the function.

41)  $y = -\cot(2x)$

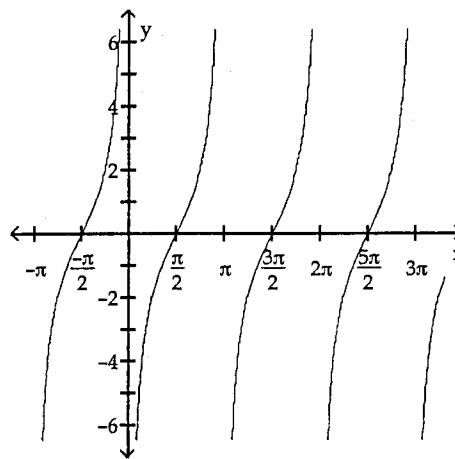
41)



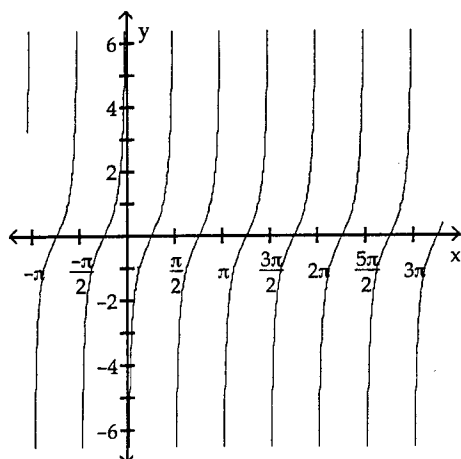
A)



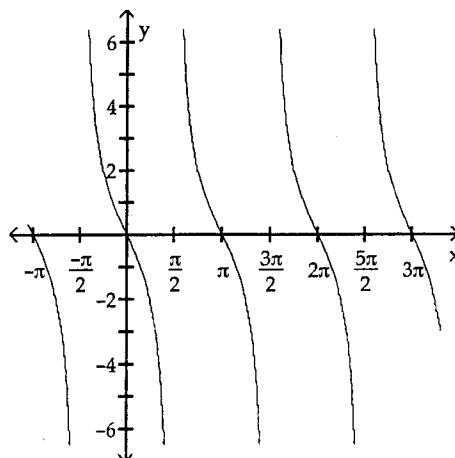
B)



C)



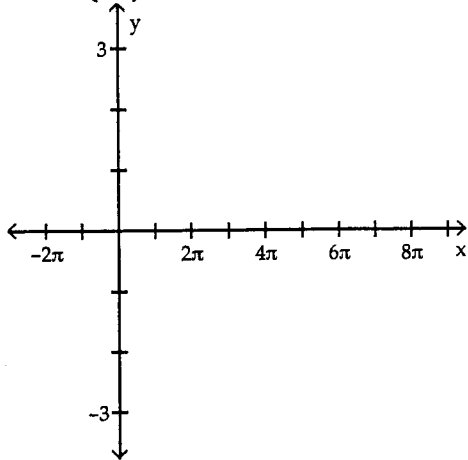
D)



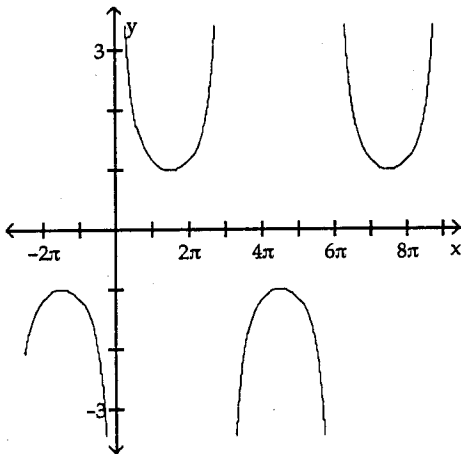
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42)

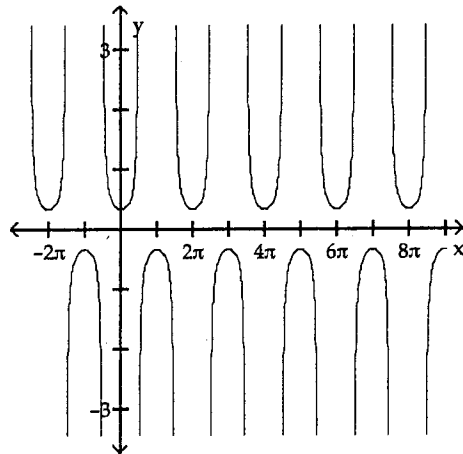
42)  $y = \sec\left(\frac{1}{3}x\right)$



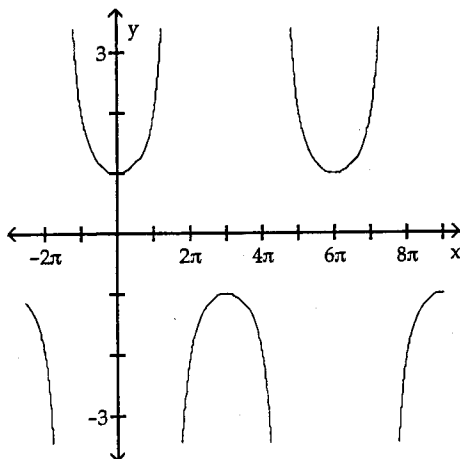
A)



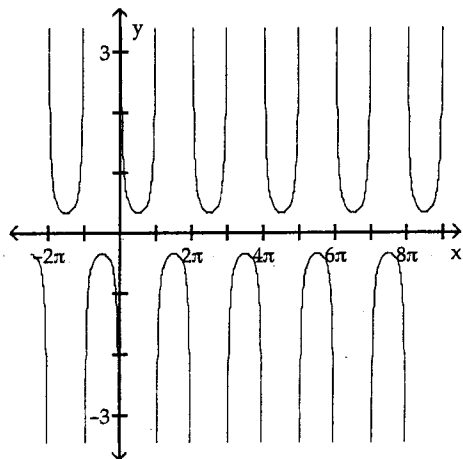
B)



C)



D)



Find the phase shift of the function.

43)  $y = 5 \cos(6x + \pi)$

43) \_\_\_\_\_

A)  $6\pi$  units to the right

B)  $\frac{\pi}{5}$  units to the left

C)  $5\pi$  units to the right

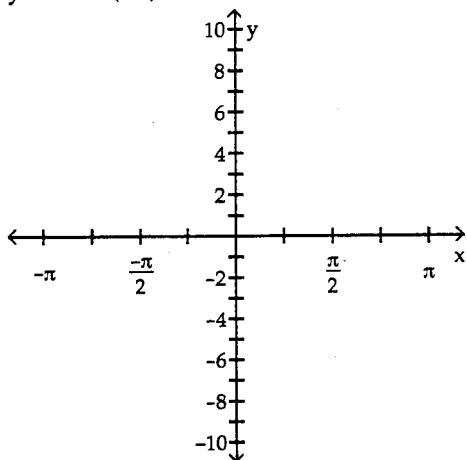
D)  $\frac{\pi}{6}$  units to the left

# Review Questions for Math 111, Part 4

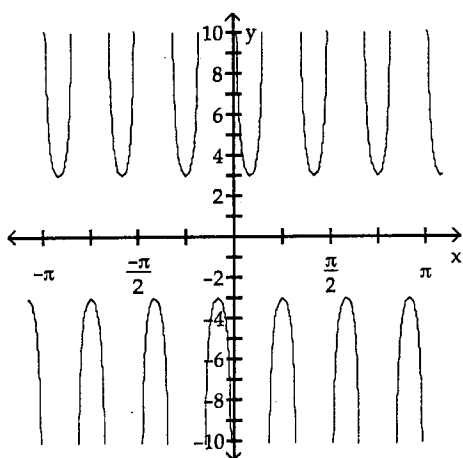
Graph the function.

44)  $y = 6 \sec(3x)$

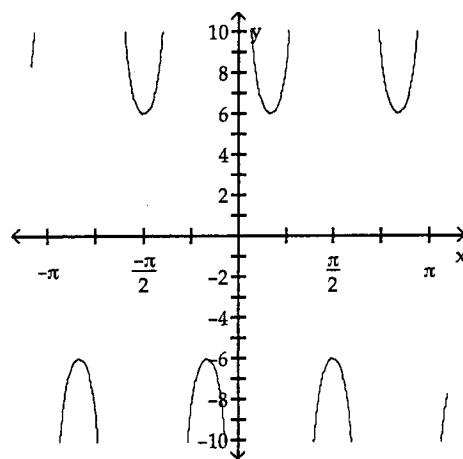
44)



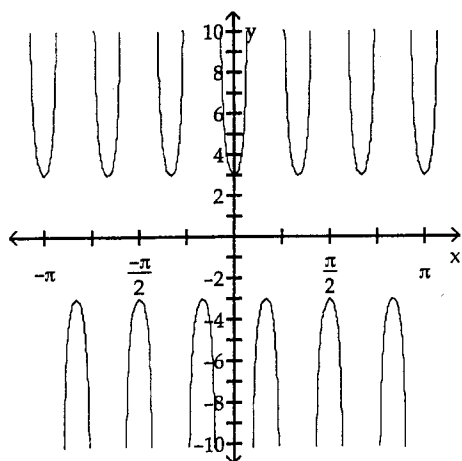
A)



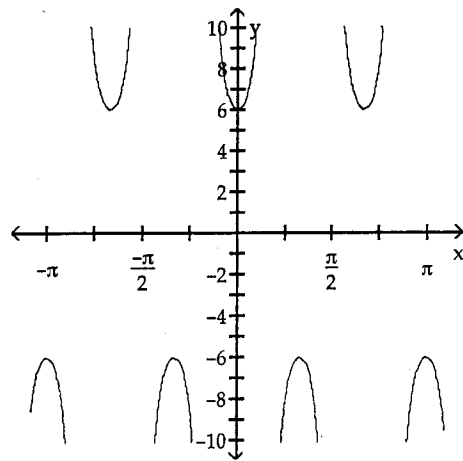
B)



C)



D)

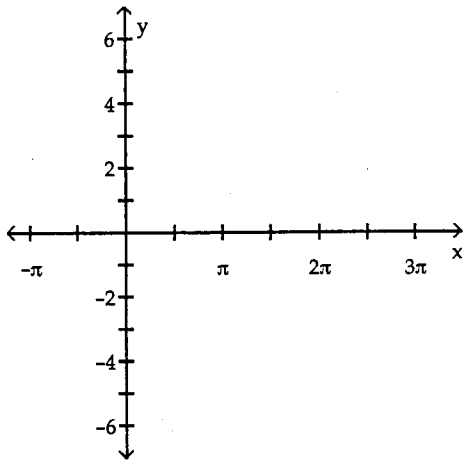


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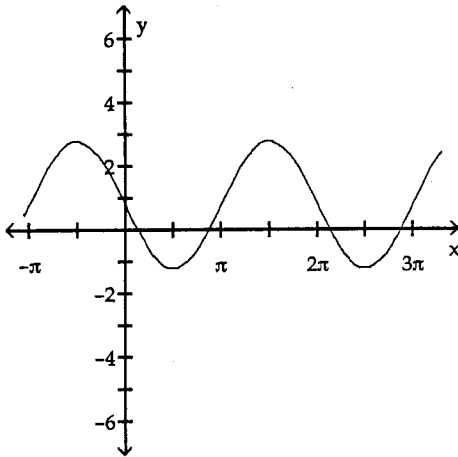
Use transformations to graph the function.

$$45) y = -2 \sin \left( x + \frac{\pi}{4} \right)$$

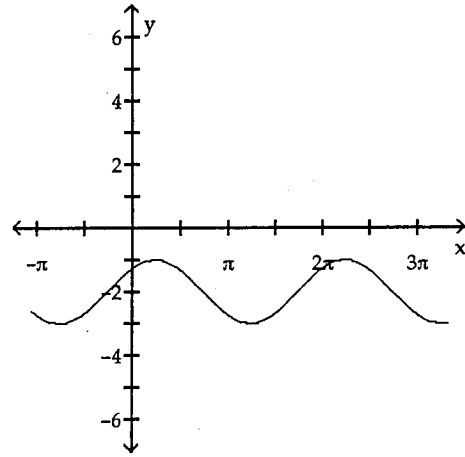
45)



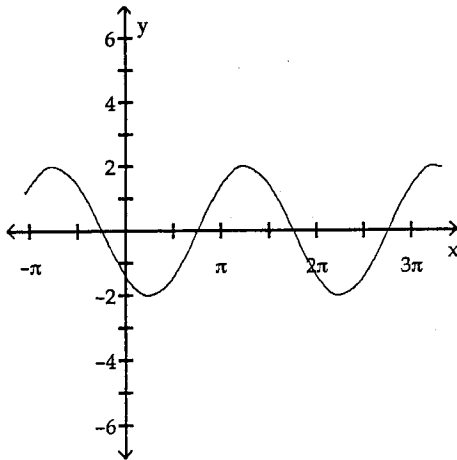
A)



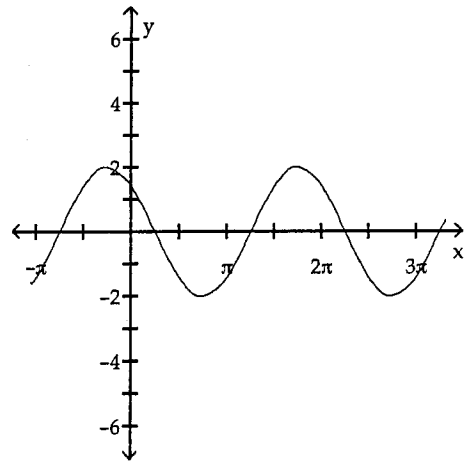
B)



C)



D)



## Review Questions for Math 111, Part 4

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

**Simplify the expression as far as possible.**

46)  $(1 + \cot \theta)(1 - \cot \theta) - \csc^2 \theta$

A)  $-2 \cot^2 \theta$

B) 0

C)  $2 \cot^2 \theta$

D) 2

46) \_\_\_\_\_

**Complete the identity.**

47)  $\tan^2 \theta - 3 \sin \theta \tan \theta \sec \theta = ?$

A)  $\sec \theta \csc \theta$

B)  $\sin \theta \tan \theta$

C)  $1 + \cot \theta$

D)  $-2 \tan^2 \theta$

47) \_\_\_\_\_

48)  $\sin^2 \theta + \sin^2 \theta \cot^2 \theta = ?$

A)  $\cot^2 \theta - 1$

B) 1

C)  $\cot^2 \theta + 1$

D)  $\sin^2 \theta + 1$

48) \_\_\_\_\_

**Find the exact value of the trigonometric function.**

49)  $\sin 15^\circ$

A)  $\frac{\sqrt{2}(\sqrt{3}-1)}{4}$

B)  $-\frac{\sqrt{2}(\sqrt{3}-1)}{4}$

C)  $-\frac{\sqrt{2}(\sqrt{3}+1)}{4}$

D)  $\frac{\sqrt{2}(\sqrt{3}+1)}{4}$

49) \_\_\_\_\_

**Find the exact value of the expression.**

50)  $\cos 50^\circ \cos 10^\circ - \sin 50^\circ \sin 10^\circ$

A)  $\frac{1}{2}$

B)  $\frac{1}{4}$

C)  $\frac{\sqrt{3}}{2}$

D)  $\sqrt{3}$

50) \_\_\_\_\_

51)  $\frac{\tan 10^\circ + \tan 20^\circ}{1 - \tan 10^\circ \tan 20^\circ}$

A) 2

B)  $\frac{\sqrt{3}}{3}$

C)  $\sqrt{3}$

D)  $\frac{1}{2}$

51) \_\_\_\_\_

**Complete the identity.**

52)  $\cos\left(\frac{\pi}{2} + \theta\right) = ?$

A)  $\sin \theta$

B)  $-\cos \theta$

C)  $\cos \theta$

D)  $-\sin \theta$

52) \_\_\_\_\_

53)  $\tan(\pi - \theta) = ?$

A)  $\cot \theta$

B)  $\tan \theta$

C)  $-\tan \theta$

D)  $-\cot \theta$

53) \_\_\_\_\_

54)  $\frac{1}{\cos^2 \theta} - \frac{1}{\cot^2 \theta} = ?$

A) 0

B)  $-\sec^2 \theta$

C) 1

D)  $1 - \sin \theta$

54) \_\_\_\_\_

55)  $\frac{\sec \theta \sin \theta}{\tan \theta} - 1 = ?$

A) 0

B)  $-\sec^2 \theta$

C)  $1 - \sin \theta$

D) 1

55) \_\_\_\_\_

## Review Questions for Math 111, Part 5

Find the exact value of the expression.

1)  $\cos^{-1} \frac{\sqrt{3}}{2}$  1) \_\_\_\_\_

- A)  $\frac{11\pi}{6}$       B)  $\frac{\pi}{4}$       C)  $\frac{7\pi}{4}$       D)  $\frac{\pi}{6}$

2)  $\sin^{-1} \frac{\sqrt{2}}{2}$  2) \_\_\_\_\_

- A)  $\frac{\pi}{4}$       B)  $\frac{3\pi}{4}$       C)  $\frac{2\pi}{3}$       D)  $\frac{\pi}{3}$

3)  $\cos^{-1} \left( -\frac{\sqrt{3}}{2} \right)$  3) \_\_\_\_\_

- A)  $\frac{5\pi}{6}$       B)  $\frac{\pi}{6}$       C)  $\frac{2\pi}{3}$       D)  $\frac{\pi}{3}$

Find the exact value of the expression. Do not use a calculator.

4)  $\tan [\tan^{-1} (-0.2)]$  4) \_\_\_\_\_

- A) -0.8      B) -0.2      C) -4.9332      D) -5

Use a calculator to find the value of the expression rounded to two decimal places.

5)  $\sin^{-1} \left( \frac{2}{5} \right)$  5) \_\_\_\_\_

- A) 1.16      B) 23.58      C) 66.42      D) 0.41

Find the exact value of the expression.

6)  $\sin (\tan^{-1} 2)$  6) \_\_\_\_\_

- A)  $5\sqrt{2}$       B)  $\frac{2\sqrt{5}}{5}$       C)  $\frac{5\sqrt{2}}{2}$       D)  $2\sqrt{5}$

7)  $\sec \left[ \sin^{-1} \left( -\frac{\sqrt{3}}{2} \right) \right]$  7) \_\_\_\_\_

- A) 2      B) 0      C)  $\frac{\sqrt{2}}{2}$       D) 1

## Review Questions for Math 111, Part 5

Solve the equation on the interval  $0 \leq \theta < 2\pi$ .

8)  $\sin(4\theta) = \frac{\sqrt{3}}{2}$

A)  $0, \frac{\pi}{4}, \pi$

C)  $\frac{\pi}{4}, \frac{5\pi}{4}$

B)  $\frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}$

D) 0

8) \_\_\_\_\_

9)  $2\sqrt{3} \sin(4\theta) = 3$

A) 0

C)  $\frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}$

B)  $0, \frac{\pi}{4}, \pi$

D)  $\frac{\pi}{4}, \frac{5\pi}{4}$

9) \_\_\_\_\_

10)  $7 \csc \theta - 1 = 6$

A)  $\frac{\pi}{2}$

B)  $\frac{3\pi}{2}$

C)  $2\pi$

D)  $\pi$

10) \_\_\_\_\_

11)  $2 \cos \theta + 1 = 0$

A)  $\frac{3\pi}{2}$

B)  $\frac{2\pi}{3}, \frac{4\pi}{3}$

C)  $\frac{\pi}{2}, \frac{3\pi}{2}$

D)  $\frac{\pi}{3}, \frac{5\pi}{3}$

11) \_\_\_\_\_

Solve the equation. Give a general formula for all the solutions.

12)  $\tan \theta = -1$

A)  $\theta = \frac{3\pi}{4} + 2k\pi$

B)  $\theta = \frac{\pi}{4} + 2k\pi$

C)  $\theta = \frac{\pi}{4} + k\pi$

D)  $\theta = \frac{3\pi}{4} + k\pi$

12) \_\_\_\_\_

Use a calculator to solve the equation on the interval  $0 \leq \theta < 2\pi$ . Round the answer to two decimal places.

13)  $\tan \theta = 3.0$

A) 1.25, 2.82

B) 1.25, 1.89

C) 1.25, 4.39

D) 1.25, 5.03

13) \_\_\_\_\_

Solve the equation on the interval  $0 \leq \theta < 2\pi$ .

14)  $\cos^2 \theta + 2 \cos \theta + 1 = 0$

A)  $\frac{\pi}{4}, \frac{7\pi}{4}$

B)  $\pi$

C)  $2\pi$

D)  $\frac{\pi}{2}, \frac{3\pi}{2}$

14) \_\_\_\_\_

15)  $\sec^2 \theta - 2 = \tan^2 \theta$

A)  $\frac{\pi}{4}$

B)  $\frac{\pi}{6}$

C)  $\frac{\pi}{3}$

D) No solution

15) \_\_\_\_\_

16)  $\sin^2 \theta + \sin \theta = 0$

A)  $0, \pi, \frac{3\pi}{2}$

B)  $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}$

C)  $0, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}$

D)  $0, \pi, \frac{\pi}{3}, \frac{2\pi}{3}$

16) \_\_\_\_\_

## Review Questions for Math 111, Part 5

17)  $\cos(2\theta) = \sqrt{2} - \cos(2\theta)$

A)  $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

C)  $0, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}$

B)  $\frac{\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{15\pi}{8}$

D) No solution

17) \_\_\_\_\_

18)  $\sec \frac{\theta}{2} = \cos \frac{\theta}{2}$

A) 0

C)  $\frac{\pi}{4}, \frac{5\pi}{4}$

B)  $0, \frac{\pi}{4}, \pi, \frac{5\pi}{3}$

D)  $\frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}$

18) \_\_\_\_\_

19)  $\cos \theta + \sin \theta = 0$

A)  $-\frac{\pi}{6}, \frac{2\pi}{3}$

B)  $\frac{3\pi}{2}$

C)  $\frac{3\pi}{4}, \frac{7\pi}{4}$

D)  $\frac{3\pi}{4}$

19) \_\_\_\_\_

20)  $\sin \theta + \sqrt{3} \cos \theta = -1$

A)  $0, \frac{2\pi}{3}$

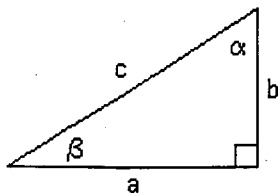
B)  $\frac{3\pi}{2}, \frac{\pi}{6}$

C)  $\frac{\pi}{2}, \frac{7\pi}{6}$

D)  $\frac{3\pi}{2}, \frac{5\pi}{6}$

20) \_\_\_\_\_

Solve the right triangle using the information given. Round answers to two decimal places, if necessary.



21)  $a = 3, \beta = 20^\circ$ ; find  $b, c$ , and  $\alpha$

A)  $b = 1.09$   
 $c = 4.19$   
 $\alpha = 70^\circ$

B)  $b = 1.09$   
 $c = 3.19$   
 $\alpha = 70^\circ$

C)  $b = 2.09$   
 $c = 4.19$   
 $\alpha = 70^\circ$

D)  $b = 2.09$   
 $c = 3.19$   
 $\alpha = 70^\circ$

21) \_\_\_\_\_

22)  $a = 5, \alpha = 25^\circ$ ; find  $b, c$ , and  $\beta$

A)  $b = 10.72$   
 $c = 11.83$   
 $\beta = 75^\circ$

B)  $b = 10.72$   
 $c = 12.83$   
 $\beta = 75^\circ$

C)  $b = 10.72$   
 $c = 12.83$   
 $\beta = 65^\circ$

D)  $b = 10.72$   
 $c = 11.83$   
 $\beta = 65^\circ$

22) \_\_\_\_\_

23)  $a = 7, b = 3$ ; find  $c, \alpha$ , and  $\beta$

A)  $c = 1.41$   
 $\alpha = 66.8^\circ$   
 $\beta = 23.2^\circ$

B)  $c = 7.62$   
 $\alpha = 67.8^\circ$   
 $\beta = 22.2^\circ$

C)  $c = 1.41$   
 $\alpha = 67.8^\circ$   
 $\beta = 22.2^\circ$

D)  $c = 7.62$   
 $\alpha = 66.8^\circ$   
 $\beta = 23.2^\circ$

23) \_\_\_\_\_



## Review Questions for Math 111, Part 5

24)  $a = 3$ ,  $c = 6$ ; find  $b$ ,  $\alpha$ , and  $\beta$

A)  $b = 5.2$   
 $\alpha = 30^\circ$   
 $\beta = 60^\circ$

B)  $b = 6.71$   
 $\alpha = 31^\circ$   
 $\beta = 59^\circ$

C)  $b = 5.2$   
 $\alpha = 60^\circ$   
 $\beta = 30^\circ$

D)  $b = 6.71$   
 $\alpha = 30^\circ$   
 $\beta = 60^\circ$

24) \_\_\_\_\_

**Solve the problem.**

25) A surveyor is measuring the distance across a small lake. He has set up his transit on one side of the lake 80 feet from a piling that is directly across from a pier on the other side of the lake. From his transit, the angle between the piling and the pier is  $55^\circ$ . What is the distance between the piling and the pier to the nearest foot?

A) 56 ft

B) 66 ft

C) 114 ft

D) 46 ft

25) \_\_\_\_\_

26) A building 150 feet tall casts a 80 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle between the end of the shadow and the vertical side of the building (to the nearest degree)? (Assume the person's eyes are level with the top of the building.)

A)  $28^\circ$

B)  $62^\circ$

C)  $32^\circ$

D)  $58^\circ$

26) \_\_\_\_\_

27) A radio transmission tower is 100 feet tall. How long should a guy wire be if it is to be attached 7 feet from the top and is to make an angle of  $34^\circ$  with the ground? Give your answer to the nearest tenth of a foot.

A) 112.2 ft

B) 166.3 ft

C) 120.6 ft

D) 178.8 ft

27) \_\_\_\_\_

28) A tree casts a shadow of 26 meters when the angle of elevation of the sun is  $24^\circ$ . Find the height of the tree to the nearest meter.

A) 11 m

B) 13 m

C) 12 m

D) 10 m

28) \_\_\_\_\_

29) A twenty-five foot ladder just reaches the top of a house and forms an angle of  $41.5^\circ$  with the wall of the house. How tall is the house? Round your answer to the nearest 0.1 foot.

A) 19 ft

B) 18.8 ft

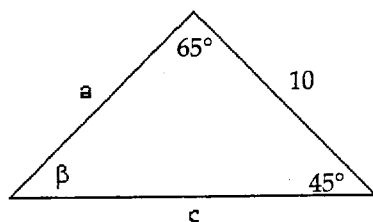
C) 18.7 ft

D) 18.6 ft

29) \_\_\_\_\_

**Solve the triangle.**

30)



A)  $a = 7.52$ ,  $c = 9.64$ ,  $\beta = 75^\circ$

C)  $a = 9.64$ ,  $c = 7.52$ ,  $\beta = 70^\circ$

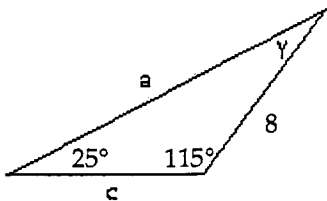
B)  $a = 9.64$ ,  $c = 7.52$ ,  $\beta = 65^\circ$

D)  $a = 7.52$ ,  $c = 9.64$ ,  $\beta = 70^\circ$

30) \_\_\_\_\_

## Review Questions for Math 111, Part 5

31)



- A)  $a = 12.17, c = 17.16, \gamma = 35^\circ$   
 C)  $a = 17.16, c = 12.17, \gamma = 40^\circ$

- B)  $a = 17.16, c = 12.17, \gamma = 45^\circ$   
 D)  $a = 12.17, c = 17.16, \gamma = 40^\circ$

31) \_\_\_\_\_

32)  $\beta = 40^\circ, \gamma = 20^\circ, b = 4$

- A)  $\alpha = 120^\circ, c = 3.13, a = 5.39$   
 C)  $\alpha = 120^\circ, c = 5.39, a = 2.13$

- B)  $\alpha = 120^\circ, c = 5.39, a = 1.13$   
 D)  $\alpha = 120^\circ, c = 2.13, a = 5.39$

32) \_\_\_\_\_

**Two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that results.**

33)  $a = 7, b = 9, \beta = 49^\circ$

- A) one triangle  
 $\alpha = 35.94^\circ, \gamma = 95.06^\circ, c = 11.88$   
 C) one triangle  
 $\alpha = 76.01^\circ, \gamma = 54.99^\circ, c = 7.60$

- B) two triangles  
 $\alpha_1 = 76.01^\circ, \gamma_1 = 54.99^\circ, c_1 = 7.60$  or  
 $\alpha_2 = 103.99^\circ, \gamma_2 = 27.01^\circ, c_2 = 12.14$   
 D) no triangle

33) \_\_\_\_\_

34)  $a = 3, b = 2, \beta = 20^\circ$

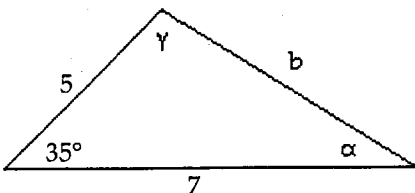
- A) two triangles  
 $\alpha_1 = 30.87^\circ, \gamma_1 = 129.13^\circ, c_1 = 4.54$  or  
 $\alpha_2 = 149.13^\circ, \gamma_2 = 10.87^\circ, c_2 = 1.1$   
 C) one triangle  
 $\alpha = 30.87^\circ, \gamma = 129.13^\circ, c = 4.54$

- B) one triangle  
 $\alpha = 149.13^\circ, \gamma = 10.87^\circ, c = 1.1$   
 D) no triangle

34) \_\_\_\_\_

**Solve the triangle.**

35)



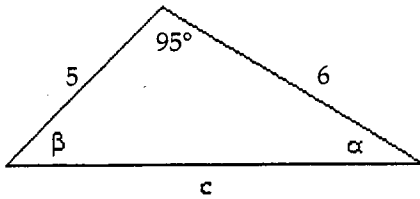
- A)  $b = 4.08, \alpha = 100.4^\circ, \gamma = 44.6^\circ$   
 C)  $b = 3.08, \alpha = 100.4^\circ, \gamma = 44.6^\circ$

- B)  $b = 4.08, \alpha = 44.6^\circ, \gamma = 100.4^\circ$   
 D)  $b = 5.08, \alpha = 44.6^\circ, \gamma = 100.4^\circ$

35) \_\_\_\_\_

Review Questions for Math 111, Part 5

36)



- A)  $c = 7.14, \alpha = 47.3^\circ, \beta = 37.7^\circ$   
 C)  $c = 9.14, \alpha = 37.7^\circ, \beta = 47.3^\circ$

- B)  $c = 8.14, \alpha = 37.7^\circ, \beta = 47.3^\circ$   
 D)  $c = 8.14, \alpha = 47.3^\circ, \beta = 37.7^\circ$

36) \_\_\_\_\_

37)  $b = 3, c = 4, \alpha = 70^\circ$

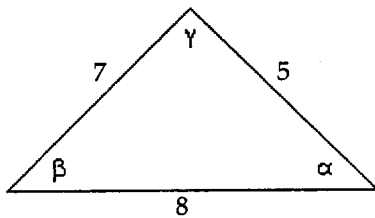
- A)  $a = 5.1, \beta = 43.5^\circ, \gamma = 66.5^\circ$   
 C)  $a = 3.1, \beta = 66.5^\circ, \gamma = 43.5^\circ$

- B)  $a = 4.1, \beta = 43.5^\circ, \gamma = 66.5^\circ$   
 D)  $a = 4.1, \beta = 66.5^\circ, \gamma = 43.5^\circ$

37) \_\_\_\_\_

Solve the triangle. Find the angles  $\alpha$  and  $\beta$  first.

38)

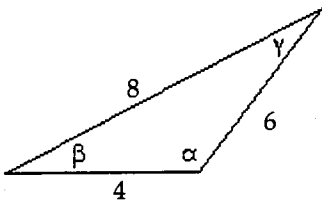


- A)  $\alpha = 60^\circ, \beta = 81.8^\circ, \gamma = 38.2^\circ$   
 C)  $\alpha = 38.2^\circ, \beta = 81.8^\circ, \gamma = 60^\circ$

- B)  $\alpha = 60^\circ, \beta = 38.2^\circ, \gamma = 81.8^\circ$   
 D)  $\alpha = 38.2^\circ, \beta = 60^\circ, \gamma = 81.8^\circ$

38) \_\_\_\_\_

39)



- A)  $\alpha = 104.5^\circ, \beta = 28.9^\circ, \gamma = 46.6^\circ$   
 C)  $\alpha = 46.6^\circ, \beta = 28.9^\circ, \gamma = 104.5^\circ$

- B)  $\alpha = 46.6^\circ, \beta = 104.5^\circ, \gamma = 28.9^\circ$   
 D)  $\alpha = 104.5^\circ, \beta = 46.6^\circ, \gamma = 28.9^\circ$

39) \_\_\_\_\_

40)  $a = 8, b = 8, c = 5$

- A)  $\alpha = 36.4^\circ, \beta = 71.8^\circ, \gamma = 71.8^\circ$   
 C)  $\alpha = 71.8^\circ, \beta = 71.8^\circ, \gamma = 36.4^\circ$

- B)  $\alpha = 72.8^\circ, \beta = 72.8^\circ, \gamma = 34.4^\circ$   
 D)  $\alpha = 71.8^\circ, \beta = 36.4^\circ, \gamma = 71.8^\circ$

40) \_\_\_\_\_

# Answers to the Review Questions for Math 114

## ~~PART 1~~

- 1) B
- 2) B
- 3) C
- 4) B
- 5) A
- 6) A
- 7) D
- 8) C
- 9) C
- 10) B
- 11) B
- 12) C
- 13) D
- 14) A
- 15) C
- 16) D
- 17) D
- 18) B
- 19) C
- 20) B
- 21) D
- 22) A
- 23) C
- 24) B
- 25) A
- 26) C
- 27) B
- 28) C
- 29) A
- 30) B
- 31) C    46) D
- 32) C    47) C
- 33) A    48) A
- 34) A    49) B
- 35) A    50) B
- 36) A    51) D
- 37) C    52) C
- 38) B    53) D
- 39) C    54) B
- 40) B    55) A
- 41) A    56) A
- 42) E    57) C
- 43) D    58) B
- 44) B    59) C
- 45) A    60) A

## ~~PART 2~~

- 1) A
- 2) B
- 3) D
- 4) D
- 5) C
- 6) B
- 7) D
- 8) C
- 9) C
- 10) C
- 11) A
- 12) D
- 13) B
- 14) C
- 15) B
- 16) D
- 17) A
- 18) B
- 19) D
- 20) A
- 21) A
- 22) D
- 23) A
- 24) B
- 25) A
- 26) C
- 27) C
- 28) C
- 29) A
- 30) B
- 31) D
- 32) B
- 33) B
- 34) D
- 35) A    46) D
- 36) D    47) A
- 37) D    48) C
- 38) C    49) A
- 39) B    50) A
- 40) B    51) C
- 41) C    52) A
- 42) B    53) B
- 43) A    54) B
- 44) B    55) B
- 45) C    56) A

## ~~PART 3~~

- 1) A
- 2) B
- 3) A
- 4) D
- 5) B
- 6) B
- 7) B
- 8) C
- 9) A
- 10) A
- 11) A
- 12) B
- 13) B
- 14) B
- 15) B
- 16) A
- 17) B
- 18) D
- 19) D
- 20) A
- 21) C
- 22) B
- 23) C
- 24) C
- 25) B
- 26) D
- 27) C
- 28) B
- 29) D
- 30) C
- 31) D
- 32) D
- 33) A
- 34) C
- 35) B
- 36) A
- 37) D
- 38) C
- 39) D
- 40) D
- 41) A
- 42) B

## PART 4

- 1) A
- 2) B
- 3) A
- 4) C
- 5) C
- 6) B
- 7) C
- 8) D
- 9) B
- 10) D
- 11) D
- 12) A
- 13) D
- 14) D
- 15) C
- 16) O
- 17) D
- 18) C
- 19) D
- 20) A
- 21) B
- 22) D
- 23) D
- 24) C
- 25) C
- 26) C
- 27) C
- 28) A
- 29) A
- 30) C
- 31) A
- 32) B
- 33) D
- 34) A
- 35) C
- 36) A    46) A
- 37) C    47) D
- 38) B    48) B
- 39) D    49) A
- 40) C    50) A
- 41) C    51) B
- 42) C    52) D
- 43) D    53) C
- 44) D    54) C
- 45) C    55) A

## PART 5

- 1) D
- 2) A
- 3) A
- 4) B
- 5) D
- 6) B
- 7) A
- 8) B
- 9) C
- 10) A
- 11) B
- 12) D
- 13) C
- 14) B
- 15) D
- 16) A
- 17) B
- 18) A
- 19) C
- 20) D
- 21) B
- 22) D
- 23) D
- 24) A
- 25) C
- 26) A
- 27) B
- 28) C
- 29) C
- 30) D
- 31) C
- 32) D
- 33) A
- 34) A
- 35) B
- 36) B
- 37) B
- 38) B
- 39) D
- 40) C