

Exam Review 2016

Wednesday, December 07, 2016
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CAT Review for Sem 2 Exam

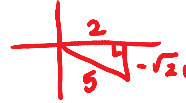
Name Key Tr

ig Ch 1 & Ch. 2

Use the fundamental identities to find the value of the trigonometric function.

1) Find $\sin \theta$, given that $\cos \theta = \frac{2}{5}$ and θ is in quadrant IV.

$$\sqrt{25-4}$$



1) $\frac{-\sqrt{21}}{5}$

2) Assume that $\sin \theta = \frac{2}{7}$ in Quadrant I. Find the remaining 5 trigonometric functions.



$$\frac{7 \cdot \sqrt{5}}{3\sqrt{5} \cdot \sqrt{5}} = \frac{7\sqrt{5}}{15}$$

$$\frac{2 \cdot \sqrt{5}}{3\sqrt{5} \cdot \sqrt{5}} = \frac{2\sqrt{5}}{15}$$

$$\begin{aligned} \sin \theta &= \frac{2}{7} & \csc \theta &= \frac{7}{2} \\ \cos \theta &= \frac{3\sqrt{5}}{7} & \sec \theta &= \frac{7}{3\sqrt{5}} \\ \tan \theta &= \frac{2\sqrt{5}}{15} & \cot \theta &= \frac{3\sqrt{5}}{2} \end{aligned}$$

Without using a calculator, give the exact trigonometric function value with rational denominator.

3) $\cot 30^\circ$

$$\frac{\sqrt{3}}{\frac{1}{2}}$$

3) $\sqrt{3}$

4) $\csc 45^\circ$

$$\frac{2}{\frac{\sqrt{2}}{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

4) $\sqrt{2}$

Find all values of θ , if θ is in the interval $[0, 360^\circ)$ and has the given function value.

5) $\sin \theta = \frac{\sqrt{2}}{2}$

$$+ | +$$

5) D

A) 45° and 315°

B) 135° and 225°

C) 225° and 315°

D) 45° and 135°

6) $\cos \theta = -\frac{\sqrt{3}}{2}$

$$\frac{30}{30} | -$$

6) A

A) 150° and 210°

B) 210° and 330°

C) 60° and 120°

D) 60° and 300°

7) $\csc \theta$ is undefined

7) C

A) 90°

B) 0°

C) 0° and 180°

D) 90° and 270°

8) $\tan \theta = 1$

$$+ | +$$

8) D

A) 225° and 315°

B) 135° and 225°

C) 45° and 315°

D) 45° and 225°

Find the measures of two angles, one positive and one negative, that are coterminal with the given angle.

9) 203°

9) $-157^\circ, 563^\circ$

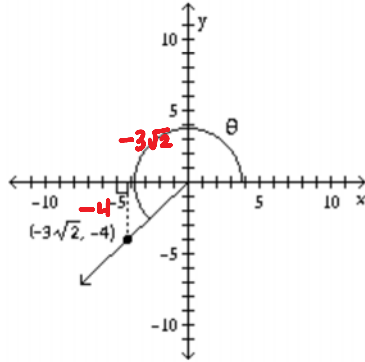
10) -136°

10) $-496^\circ, 224^\circ$

Find the trigonometric function value for the angle shown.

11) $\sin \theta$

11) B



$$\begin{aligned} (-4)^2 + (-3\sqrt{2})^2 &= r^2 \\ 16 + 18 &= r^2 \\ \sqrt{34} &= r \end{aligned}$$

A) $\sin \theta = -\frac{2\sqrt{34}}{17}$

B) $\sin \theta = -\frac{4\sqrt{34}}{34}$

C) $\sin \theta = \frac{2\sqrt{2}}{3}$

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

Suppose that θ is in standard position and the given point is on the terminal side of θ . Give the exact value of the indicated trig function for θ .

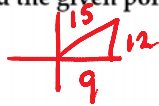
12) $(9, 12)$; find $\cos \theta$.

A) $\frac{4}{5}$

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

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

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



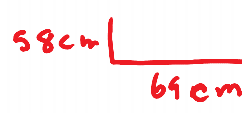
$$\frac{9}{15} = \frac{3}{5}$$

12) B

Solve the problem. Round answers to the nearest tenth if necessary.

13) A house casts a shadow 27 m long. At the same time, the shadow cast by a 58-centimeter-tall statue is 69 cm long. Find the height of the house.

13) 23 m

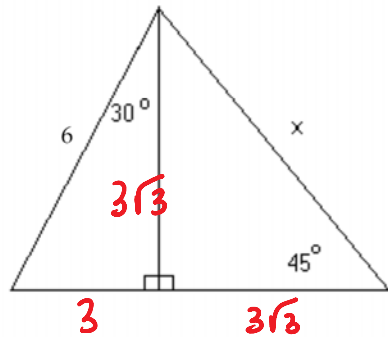


$$\frac{x}{27} = \frac{58}{69}$$

Solve the problem.

14) Find the exact value of x in the figure.

14) $3\sqrt{6}$

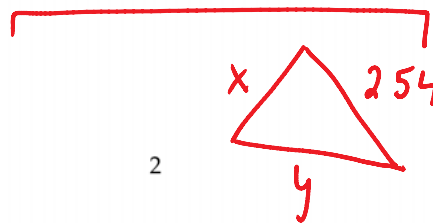
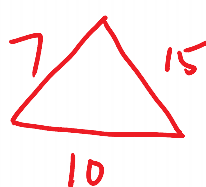


$$3\sqrt{3}\sqrt{2} =$$

Solve the problem. Round answers to the nearest tenth if necessary.

15) A triangle drawn on a map has sides of lengths 7 cm, 10 cm, and 15 cm. The longest of the corresponding real-life distances is 254 km. Find the lengths of the real-life distances for the two other sides (round to the nearest kilometer).

15) 119 km, 169 km



$$\frac{15}{254} = \frac{7}{x}$$

$$\frac{15}{254} = \frac{10}{y}$$

Trig. Ch. 3

Convert the degree measure to radians. Leave answer as a multiple of π .

16) 650°

A) $\frac{65\pi}{36}$

$\cdot \frac{\pi}{180}$

B) $\frac{65\pi}{18}$

C) $\frac{29\pi}{18}$

D) $\frac{65\pi}{9}$

16) B

Convert the radian measure to degrees. Round to the nearest hundredth if necessary.

17) $-\frac{\pi}{5}$

$\cdot \frac{180}{\pi}$

A) -36°

B) $-36\pi^\circ$

C) $-\frac{\pi^\circ}{5}$

D) -0.63°

17) A

Find a value of θ in $[0^\circ, 90^\circ]$ that satisfies the statement. Leave answer in decimal degrees rounded to seven decimal places, if necessary.

18) $\sin \theta = 0.69771214$

A) 135.756264°

B) 224.243736°

C) 45.7562643°

D) 44.2437357°

18) D

19) $\cot \theta = 1.2125044$

$\frac{1}{\tan \theta} = 1.2125044$

A) 39.5137415°

B) 34.4379333°

C) 55.5620667°

D) 50.4862585°

19) A

Find the exact value without using a calculator.

$\theta = \tan^{-1} \frac{1}{1.2125044}$

20) $\cos\left(\frac{2\pi}{3}\right)$

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

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

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

D) undefined

20) B

21) $\cos 2\pi$

A) -1

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

C) 0

D) 1

21) D

22) $\cot\left(\frac{-5\pi}{6}\right)$

30°

A) $-\sqrt{3}$

B) $\sqrt{3}$

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

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

22) B

23) Convert 75,400 in/min to mi/hr.

A) 2.9 mi/hr

B) 428.4 mi/hr

C) 71.4 mi/hr

D) 7.1 mi/hr

23) C

24) Find the angular velocity in rad/sec of a windmill that rotates 5740 rev/hr.

A) 5.0 rad/sec

B) 3.2 rad/sec

C) 601.1 rad/sec

D) 10.0 rad/sec

24) D

$$\frac{5740 \text{ rev}}{\text{hr}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} = 10.0 \text{ rad/sec}$$

$$v = r\theta$$

$$\frac{673 \text{ rev}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = \frac{80760\pi \text{ rad}}{\text{hr}}$$

Solve the problem.

25) The radius of the tires of a car is 18 inches, and they are revolving at the rate of 673 revolutions per minute. How fast is the car traveling in miles per hour? 25) A

A) $\frac{2019}{88}\pi$ mph B) $\frac{2019}{176}\pi$ mph C) $\frac{6057}{22}\pi$ mph D) $\frac{2019}{880}\pi$ mph

$$\frac{18 \text{ in}}{\text{hr}} \left(\frac{80760\pi \text{ rad}}{\text{hr}} \right) \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} = \frac{2019}{88}\pi \text{ mph}$$

26) Two cities lie on the same north-south line; City A has a bearing of 42°N and City B has a bearing of 34°N . Find the distance between the two cities. (The radius of the earth is 6400 km). Round to the nearest kilometer. 26) A

$$s = r\theta$$

$$6400 \left(\frac{8\pi}{180} \right)$$

A) 894 km

B) 3798 km

C) 284 km

D) 4691 km

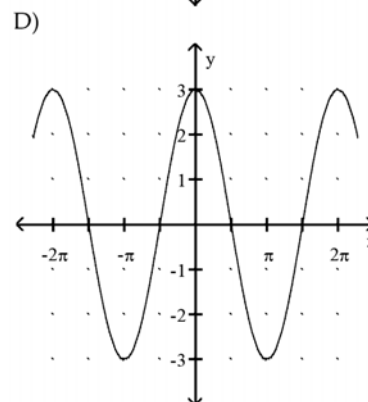
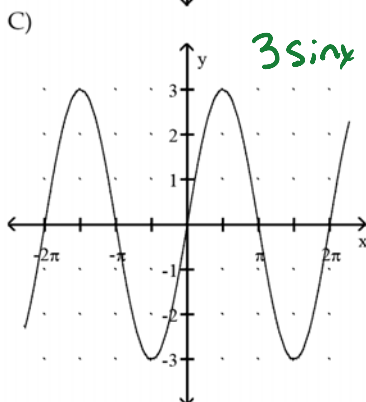
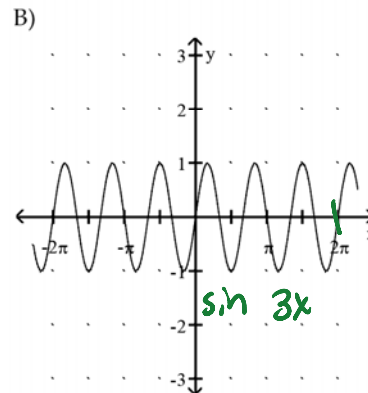
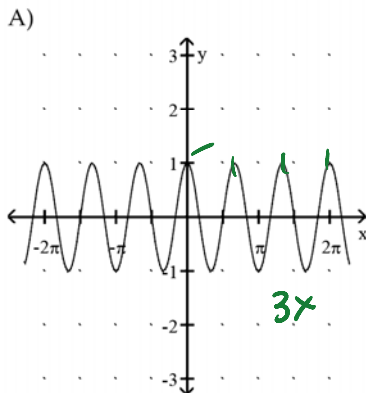


Trig Ch 4

Match the function with its graph.

- 27) 1) $y = \sin 3x$ B 2) $y = 3 \cos x$ D
 3) $y = 3 \sin x$ C 4) $y = \cos 3x$ A

27) D



A) 1A, 2B, 3C, 4D

B) 1A, 2C, 3D, 4B

C) 1A, 2D, 3C, 4B

D) 1B, 2D, 3C, 4A

Give the amplitude or period as requested.

$| -2 | = 2$

28) Amplitude of $y = -2 \cos \frac{1}{3}x$

28) A

A) 2

B) 6π

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

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

29) Amplitude of $y = -4 \sin x$

$| -4 |$

29) D

A) -4π

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

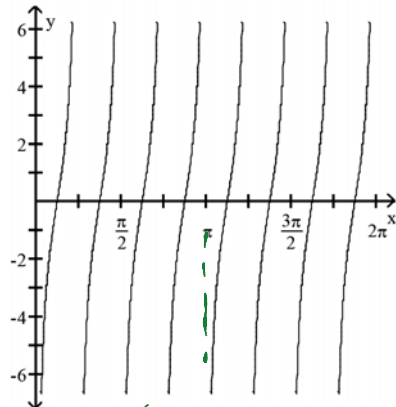
C) 2π

D) 4

The function graphed is of the form $y = a \tan bx$ or $y = a \cot bx$, where $b > 0$. Determine the equation of the graph.

30) C

30)



$\cot x =$
asympt
0, $bx = \pi$

$4y$

A) ~~$y = -3 \tan 4x$~~

B) $y = -3 \cot x$

C) $y = -3 \cot 4x$

D) $y = 4 \cot 4x$

Find the phase shift of the function.

31) $y = \cos \left[x - \frac{\pi}{2} \right]$

31) B

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

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

C) $\frac{\pi}{2}$ units down

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

$5 \sin \left(3x - \frac{\pi}{6} \right)$

32) What is the phase shift of $y = 5 \sin \left(3x - \frac{\pi}{2} \right)$ from $y = \sin x$?

32) C

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

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

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

D) right 5

Find the specified quantity.

33) Find the vertical translation of $y = -3 - 2 \sin \left(4x + \frac{\pi}{4} \right)$.

33) C

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

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

C) down 3

D) up 4

Give the amplitude or period as requested.

$$\frac{2\pi}{b} = P$$

34) Period of $y = \cos 5x$

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

B) 5

C) 1

D) 2π

34) A

35) Which graphs intersect the x-axis?

A) ~~$\cos x, \csc x$~~

B) ~~$\sin x, \sec x$~~

C) $\sin x, \tan x$

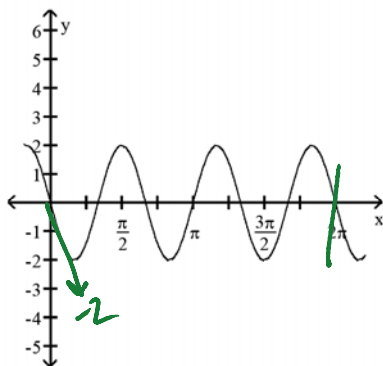
D) ~~$\tan x, \sec x$~~

35) C

The function graphed is of the form $y = a \sin bx$ or $y = a \cos bx$, where $b > 0$. Determine the equation of the graph.

36)

36) D



$$-2 \sin 3x$$

A) $y = 2 \sin(3x)$

B) $y = 2 \cos\left(\frac{1}{3}x\right)$

C) $y = -2 \cos(3x)$

D) $y = -2 \sin(3x)$

Chapter 5 Trig

Complete the sentence so the result is an identity. Let x be any real number.

$$\tan^2 x + 1 = \sec^2 x$$

37) $\underline{\quad} + \tan^2 x = \sec^2 x$

A) -1

B) $\cos^2 x$

C) $\sin^2 x$

D) 1

37) D

38) $\sin x = (\underline{\quad})(\cos x)$

A) $\sec x$

B) $\cot x$

$$\frac{\sin x}{\cos x} = \tan x$$

C) $\tan x$

D) $\csc x$

38) C

39) $\cos x = (\cot x)(\underline{\quad})$

A) $\csc x$

B) $\sin x$

$$\frac{\cos x}{\sin x} = \cot x$$

C) $\sec x$

D) $\tan x$

39) B

Write the expression in terms of sine and cosine, and simplify so that no quotients appear in the final expression.

40) $\tan x(\cot x - \cos x)$

A) $-\sec^2 x$

B) $1 - \sin x$

C) 1

D) 0

40) B

$$1 - \sin x$$

41) $\frac{\sin 2x - 1}{\cos(-x)} = \frac{-\cos^2 x}{\cos x} = -\cos x$ 41) B
 A) $\sin x$ B) $-\cos x$ C) $-\sin x$ D) $\cos x$

Use a sum or difference identity to find the exact value.

42) $\sin \frac{\pi}{15} \cos \frac{4\pi}{15} + \cos \frac{\pi}{15} \sin \frac{4\pi}{15}$ 42) D
formula from yellow sheet
 A) $\frac{1}{2}$ B) 1 C) $\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{3}}{2}$

Use an identity to write the expression as a single trigonometric function or as a single number.

43) $2 \cos^2 75^\circ - 1 = \cos 2(75) = \cos 150$ 43) D
 A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$

Use identities to find the indicated value for each angle measure.

44) $\sin \theta = \frac{21}{29}$, $\cos \theta > 0$ Find $\cos(2\theta)$. 44) C
 $1 - 2 \sin^2 \theta$
 $1 - 2 \left(\frac{21}{29}\right)^2$
 A) $\frac{840}{841}$ B) $-\frac{43}{841}$ C) $-\frac{41}{841}$ D) $\frac{41}{841}$

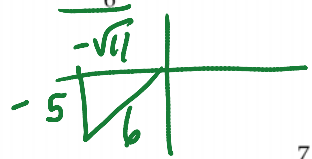
Determine all solutions of the equation in radians.

45) Find $\cos \frac{x}{2}$, given that $\cos x = \frac{1}{4}$ and x terminates in $0 < x < \frac{\pi}{2}$. 45) C
 $\sqrt{\frac{1 + \frac{1}{4}}{2}} \left(\frac{1}{4}\right) = \sqrt{\frac{4+1}{8}}$
 $\sqrt{\frac{5}{8}} = \frac{\sqrt{5} \sqrt{2}}{2 \sqrt{2} \sqrt{2}} = \frac{\sqrt{10}}{4}$
 A) $\frac{\sqrt{8 + 2\sqrt{15}}}{4}$ B) $\frac{\sqrt{8 - 2\sqrt{15}}}{4}$ C) $\frac{\sqrt{10}}{4}$ D) $\frac{\sqrt{6}}{4}$

Use the fundamental identities to find the value of the trigonometric function.

46) Find $\cos \theta$ if $\tan \theta = \frac{2}{5}$ and θ is in quadrant III. 46) C
 A) $\frac{4}{5}$ B) $\frac{\sqrt{33}}{4}$ C) $-\frac{5\sqrt{29}}{29}$ D) $-\frac{\sqrt{11}}{6}$
 $-\frac{5}{2\sqrt{29}}$

47) Find $\sin \theta$ if $\cos \theta = -\frac{\sqrt{11}}{6}$ and θ is in quadrant III. 47) B
 A) $-\frac{25}{36}$ B) $-\frac{5}{6}$ C) $-\frac{\sqrt{3}}{12}$ D) $\frac{5}{6}$



$$1 + \cot^2 \theta = \csc^2 \theta$$

Write the expression in terms of sine and cosine, and simplify so that no quotients appear in the final expression.

48) $(1 + \cot \theta)(1 - \cot \theta) - \csc^2 \theta$ $1 - \cot^2 \theta - \csc^2 \theta$ 48) D

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

- A) $2 \cot^2 \theta$ B) 0 C) 2 D) $-2 \cot^2 \theta$

Factor the trigonometric expression and simplify.

49) $1 - 2 \sin^2 x + \sin^4 x$ $(1 - \sin^2 x)^2$ 49) D

$(\cos^2 x)^2$ $- \cot^2 \theta - \cot^2 \theta$
 $- 2 \cot^2 \theta$

- A) $(1 - \sin^2 x)$ B) $\sin^2 x$ C) $(1 + \tan^2 x)$ D) $\cos^4 x$

Decide whether the expression is or is not an identity.

50) $\sqrt{\sin^2 x + \cos^2 x} = 1$ 50) A

- A) Identity B) Not an identity

Ch. 6 Trig

Restrictions	\cot	all
	\sin	\tan

Give the degree measure of θ .

51) $\theta = \cos^{-1} \left(\frac{\sqrt{2}}{2} \right)$ 51) A

- A) 45° B) 330° C) 225° D) 30°

Find the exact value of the real number y.

52) $y = \sin^{-1} (0.5)$ 52) D

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

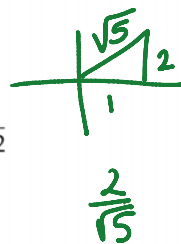
53) $y = \cot^{-1} (-1)$ 53) C

- A) $\frac{\pi}{4}$ B) $\frac{5\pi}{4}$ C) $\frac{3\pi}{4}$ D) $\frac{7\pi}{4}$

Evaluate the expression.

54) $\sin(\arctan 2)$ 54) A

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



Solve the equation for the interval $[0, 2\pi)$.

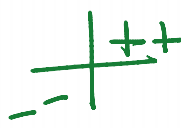
55) $\cos^2 x + 2 \cos x + 1 = 0$ 55) A

$(\cos x + 1)(\cos x + 1) = 0$

- A) $\{\pi\}$ B) $\left\{ \frac{\pi}{4}, \frac{7\pi}{4} \right\}$ C) $\left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$ D) $\{2\pi\}$

$\cos x = -1$

56) $\cos x = \sin x$



56) B

- A) $\left\{\frac{3\pi}{4}, \frac{5\pi}{4}\right\}$ B) $\left\{\frac{\pi}{4}, \frac{5\pi}{4}\right\}$ C) $\left\{\frac{\pi}{4}, \frac{7\pi}{4}\right\}$ D) $\left\{\frac{3\pi}{4}, \frac{7\pi}{2}\right\}$

57) $\sin^2 x + \sin x = 0$

$\sin x (\sin x + 1) = 0$
 $\sin x = 0$ $\sin x = -1$

57) B

- A) $\left\{0, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}\right\}$ B) $\left\{0, \pi, \frac{3\pi}{2}\right\}$ C) $\left\{0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}\right\}$ D) $\left\{0, \pi, \frac{\pi}{3}, \frac{2\pi}{3}\right\}$

Solve the equation in the interval $[0^\circ, 360^\circ)$.

58) $\sin^2 \theta - \sin \theta - 12 = 0$

$(\sin \theta - 4)(\sin \theta + 3) = 0$
 $\sin \theta = 4$
 $\sin \theta = -2$

58) C

- A) $\{45^\circ, 315^\circ\}$ B) $\{45^\circ, 135^\circ\}$ C) \emptyset D) $\{45^\circ\}$

Determine the solution set of each equation in radians (for x) or degrees (for θ) to the nearest tenth as appropriate.

59) $\cos^2 x - 1 = 0$

$\cos x - 1 = 0$ $\cos x + 1 = 0$



59) D

- A) $\left\{\frac{\pi}{2} + 2n\pi\right\}$ B) $\{2n\pi\}$ C) $\left\{\frac{\pi}{3} + n\pi\right\}$ D) $\{n\pi\}$

60) $2 \sin^2 x + \sin x = 1$

$2 \sin^2 x + \sin x - 1 = 0$
 $(2 \sin x - 1)(\sin x + 1) = 0$

60) B

- A) $\left\{\frac{\pi}{2} + 2n\pi, \frac{5\pi}{6} + 2n\pi, \frac{3\pi}{2} + 2n\pi\right\}$ B) $\left\{\frac{\pi}{6} + 2n\pi, \frac{5\pi}{6} + 2n\pi, \frac{3\pi}{2} + 2n\pi\right\}$
 C) $\left\{\frac{\pi}{6} + 2n\pi, \frac{5\pi}{6} + 2n\pi\right\}$ D) $\left\{\frac{\pi}{6} + 2n\pi, \frac{3\pi}{2} + 2n\pi\right\}$

$\frac{\pi}{6} | \frac{5\pi}{6}$ $\sin x = \frac{1}{2}$

$\sin x = -1$ $\frac{3\pi}{2}$

Solve the equation for solutions in the interval $[0, 2\pi)$.

61) $\sin 4x = \frac{\sqrt{3}}{2}$

$\sin \theta = \frac{\sqrt{3}}{2}$

$4x = \theta$

61) D

- A) $\{0\}$ B) $\left\{\frac{\pi}{4}, \frac{5\pi}{4}\right\}$
 C) $\left\{0, \frac{\pi}{4}, \pi\right\}$ D) $\left\{\frac{\pi}{12}, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{7\pi}{12}, \frac{7\pi}{6}, \frac{13\pi}{12}, \frac{5\pi}{3}, \frac{19\pi}{12}\right\}$

$\frac{\pi}{3}$ $\frac{2\pi}{3}$
 $\frac{2\pi}{3}$ $\frac{4\pi}{3}$
 $\frac{4\pi}{3}$ $\frac{5\pi}{3}$
 $\frac{5\pi}{3}$ $\frac{7\pi}{3}$
 $\frac{7\pi}{3}$ $\frac{8\pi}{3}$
 $\frac{8\pi}{3}$ $\frac{10\pi}{3}$
 $\frac{10\pi}{3}$ $\frac{11\pi}{3}$
 $\frac{11\pi}{3}$ $\frac{13\pi}{3}$
 $\frac{13\pi}{3}$ $\frac{14\pi}{3}$
 $\frac{14\pi}{3}$ $\frac{16\pi}{3}$
 $\frac{16\pi}{3}$ $\frac{17\pi}{3}$
 $\frac{17\pi}{3}$ $\frac{19\pi}{3}$
 $\frac{19\pi}{3}$ $\frac{20\pi}{3}$

Solve the equation for solutions in the interval $[0^\circ, 360^\circ)$. Round to the nearest degree.

62) $\cos^2 \frac{\theta}{2} = 1$

$\sqrt{\cos^2 x} = \pm 1$



$x = 0, 180$
 $\frac{\theta}{2}$

$0, 360$

62) A

- A) $\{0^\circ\}$
- B) $\{0^\circ, 45^\circ, 90^\circ, 135^\circ, 180^\circ, 225^\circ, 270^\circ\}$
- C) $\{33^\circ, 57^\circ, 123^\circ, 147^\circ, 213^\circ, 237^\circ, 303^\circ, 327^\circ\}$
- D) $\{0^\circ, 90^\circ, 180^\circ, 270^\circ\}$

Solve the equation for x.

63) $y = 8 \cos 3x$

$\frac{y}{8} = \cos 3x$
 $\frac{1}{3} \arccos \frac{y}{8} = 3x$

63) D

- A) $x = 8 \arccos \frac{y}{3}$
- B) $x = 3 \arccos \frac{y}{8}$
- C) $x = \frac{1}{8} \arccos \frac{y}{3}$
- D) $x = \frac{1}{3} \arccos \frac{y}{8}$

Ch 7 Trig

Determine whether there is sufficient information for solving a triangle, with the given combination of angles and sides, by the law of sines.

64) a, b, and c

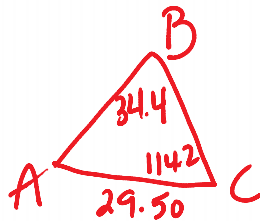
- A) Yes

B) No

64) B

Solve the triangle.

65) $B = 34.4^\circ$
 $C = 114.2^\circ$
 $b = 29.50$



$\frac{29.5}{\sin 34.4} = \frac{c}{\sin 114.2}$
 $c = 47.67$
 $a = 27.2$

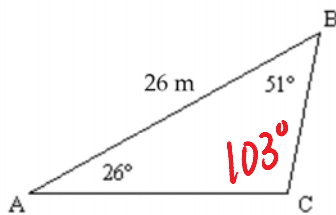
65) C

- A) $A = 29.4^\circ, a = 49.63, c = 29.20$
- C) $A = 31.4^\circ, a = 27.20, c = 47.63$

- B) $A = 31.4^\circ, a = 29.20, c = 49.63$
- D) $A = 29.4^\circ, a = 47.63, c = 27.20$

$A = 31.4$

66)



$\sin \frac{26}{103^\circ} = \frac{b}{\sin 51}$
 $b = 20.7$
 $a = 11.7$

66) B

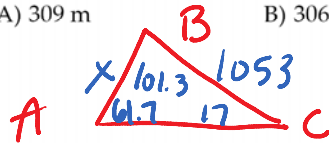
- A) $C = 103^\circ, a = 57.8 \text{ m}, b = 32.6 \text{ m}$
- C) $C = 103^\circ, a = 20.7 \text{ m}, b = 11.7 \text{ m}$

- B) $C = 103^\circ, a = 11.7 \text{ m}, b = 20.7 \text{ m}$
- D) $C = 97^\circ, a = 11.5 \text{ m}, b = 20.4 \text{ m}$

Solve the problem.

67) To find the distance AB across a river, a distance BC = 1053 m is laid off on one side of the river. It is found that B = 101.3° and C = 17.0°. Find AB rounded to the nearest meter.

- A) 309 m B) 306 m C) 350 m D) 353 m



$$\frac{1053}{\sin 17} = \frac{x}{\sin 101.3} \quad x = 350$$

67) C

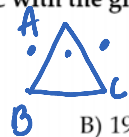
Find the area of triangle ABC with the given parts. Round to the nearest whole number.

68) A = 26.4°

b = 12.3 in.

c = 7.7 in.

A) 42.4 in.²



B) 19.1 in.²

C) 21.1 in.²

D) 44.4 in.²

$$\frac{1}{2} (12.3)(7.7)(\sin 26.4)$$

68) C

Solve the problem.

69) Find the area of a triangular-shaped field with sides of 225.2 m and 151.7 m, and the included angle between them measuring 60.08°. Round to the nearest square meter.

A) 8520 m²

B) 29,610 m²

C) 14,805 m²

D) 17,040 m²

$$\frac{1}{2} (225.2)(151.7) \sin 60.08$$

Find the missing parts of the triangle.

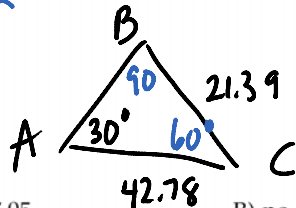
70) A = 30.0°

a = 21.39

b = 42.78

A) B = 60.0°, C = 90.0°, c = 37.05

C) B = 60.0°, C = 60.0°, c = 37.05



B) no such triangle

D) B = 90.0°, C = 60.0°, c = 37.05

$$\frac{21.39}{\sin 30} = \frac{42.78}{\sin B}$$

$$B = 90^\circ$$

$$\frac{c}{\sin 60} = \frac{21.39}{\sin 30}$$

$$c = 37.05$$

70) D

71) B = 11.4°

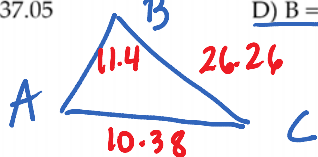
b = 10.38

a = 26.26

A) A₁ = 30°, C₁ = 138.6°, c₁ = 34.73;

A₂ = 150°, C₂ = 18.6°, c₂ = 16.75

C) A = 150°, C = 18.6°, c = 16.75



B) no such triangle

D) A = 30°, C = 138.6°, c = 34.73

$$\frac{10.38}{\sin 11.4} = \frac{26.26}{\sin A}$$

$$A_1 = 30^\circ \quad A_2 = 150^\circ$$

71) A

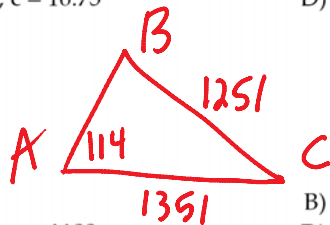
72) A = 114°

a = 1251 cm

b = 1351 cm

A) no such triangle

C) B = 29.3°, C = 36.7°, c = 1188 cm



B) B = 32.8°, C = 33.2°, c = 1188 cm

D) B = 36.7°, C = 29.3°, c = 1188 cm

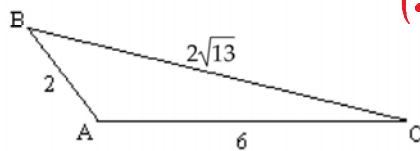
$$\frac{1251}{\sin 114} = \frac{1351}{\sin B}$$

$$B = \cancel{80.6}^\circ$$

72) A

Find the indicated angle or side.

73) Find the measure of angle A.



$$(2\sqrt{13})^2 = 2^2 + 6^2 - 2(2)(6)\cos A$$

$$120^\circ = A$$

73) C

A) 140°

B) 135°

C) 120°

D) 60°

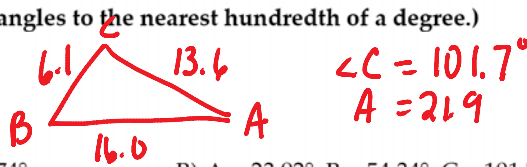
Find the missing parts of the triangle. (Find angles to the nearest hundredth of a degree.)

74) a = 6.1 in.

b = 13.6 in.

c = 16.0 in.

#15
a bit off



A) A = 19.92°, B = 56.34°, C = 103.74°

B) A = 23.92°, B = 54.34°, C = 101.74°

C) A = 21.92°, B = 56.34°, C = 101.74°

D) No triangle satisfies the given conditions.

74) C

$$\frac{6.1}{\sin A} = \frac{16}{\sin 101.7}$$

Find the area of triangle ABC with the given parts. Round to the nearest whole number.

75) a = 17.4 cm

b = 15.0 cm

c = 13.4 cm

$$s = 22.9 \quad \sqrt{22.9(-15)(-17.4)(-13.4)}$$

A) 100 cm²

B) 97 cm²

C) 106 cm²

D) 103 cm²

75) B

Find the magnitude and direction angle (to the nearest tenth) for each vector. Give the measure of the direction angle as an angle in $[0, 360^\circ]$.

76) $(5\sqrt{2}, -5\sqrt{2})$

A) $10\sqrt{2}; 45^\circ$

B) 10; 315°

C) 10; 135°

D) 20; 315°

$$\sqrt{50+50} = 10 \quad \tan \theta = \frac{-5\sqrt{2}}{5\sqrt{2}}$$



76) B

Vector v has the given magnitude and direction. Find the magnitude of the indicated component of v .

77) $\alpha = 59.3^\circ, |v| = 79.9$

Find the horizontal component of v .

A) 68.7

B) 109.5

C) 27.9

D) 40.8

$$79.9 \cos 59.3$$

77) D

Write the vector in the form $\langle a, b \rangle$.

78) $\alpha = 140^\circ, |v| = 11$

A) $\approx \langle -7.78, 7.78 \rangle$

B) $\approx \langle -7.07, 8.43 \rangle$

C) $\approx \langle -8.43, 7.07 \rangle$

D) $\approx \langle -0.77, 0.64 \rangle$

$$11 \cos 140, \quad 11 \sin 140$$

78) C

Two forces act at a point in the plane. The angle between the two forces is given. Find the magnitude of the resultant force.

79) forces of 59.0 and 62.5 lb, forming an angle of 30.7°

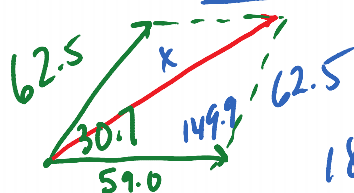
A) 1046 lb

B) 117 lb

C) 106 lb

D) 32 lb

79) B



$$x^2 = 59^2 + 62.5^2 - 2(59)(62.5)\cos 149.9$$

$$x = 117 \text{ lb}$$

$$180 - 30.1$$

Ch 8 Trig

Write the complex number in rectangular form.

80) $10 \operatorname{cis} 135^\circ$

A) $10\sqrt{3} + 5i\sqrt{3}$

B) $5\sqrt{2} - 5i\sqrt{2}$

C) $-5\sqrt{2} + 5i\sqrt{2}$

D) $10\sqrt{2} - 5i\sqrt{2}$

80) C

$10(-\frac{\sqrt{2}}{2} + i\frac{\sqrt{2}}{2})$

Write the complex number in trigonometric form $r(\cos \theta + i \sin \theta)$, with θ in the interval $[0^\circ, 360^\circ)$.

81) $2 - 2\sqrt{3}i$

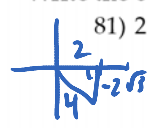
A) $4(\cos 150^\circ + i \sin 150^\circ)$

B) $2(\cos 330^\circ + i \sin 330^\circ)$

C) $2(\cos 330^\circ + i \sin 330^\circ)$

D) $4(\cos 300^\circ + i \sin 300^\circ)$

81) D



$4(\operatorname{cis} 300^\circ)$

Find the product. Write the product in rectangular form, using exact values.

82) $[4 \operatorname{cis} 135^\circ] [6 \operatorname{cis} 225^\circ]$

A) $24i$

B) 24

C) -24

D) $-24i$

82) B

$24[\operatorname{cis} 360^\circ]$

$24[1 + 0i]$

Find the following quotient, and write the quotient in rectangular form, using exact values.

83) $\frac{8(\cos 90^\circ + i \sin 90^\circ)}{3(\cos 30^\circ + i \sin 30^\circ)}$

A) $1 + \sqrt{3}i$

B) $\frac{5}{2} + \frac{5\sqrt{3}}{2}i$

C) $8 + 8\sqrt{3}i$

D) $\frac{4}{3} + \frac{4\sqrt{3}}{3}i$

83) D

$\frac{8}{3}[\operatorname{cis} 60^\circ]$ $\frac{8}{3}[\frac{1}{2} + \frac{\sqrt{3}}{2}i]$

Find all solutions of the equation. Leave answers in trigonometric form.

84) $x^4 + 16 = 0$

A) $\{\sqrt{2} \operatorname{cis} 45^\circ, \sqrt{2} \operatorname{cis} 315^\circ, \sqrt{2} \operatorname{cis} 135^\circ, \sqrt{2} \operatorname{cis} 225^\circ\}$

B) $\{2 \operatorname{cis} 45^\circ, 2 \operatorname{cis} 315^\circ, 2 \operatorname{cis} 135^\circ, 2 \operatorname{cis} 225^\circ\}$

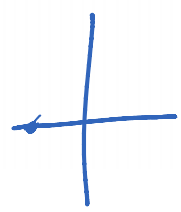
C) $\{16 \operatorname{cis} 45^\circ, 16 \operatorname{cis} 315^\circ, 16 \operatorname{cis} 135^\circ, 16 \operatorname{cis} 225^\circ\}$

D) $\{\sqrt{3} \operatorname{cis} 26.565^\circ, \sqrt{3} \operatorname{cis} 333.435^\circ, \sqrt{3} \operatorname{cis} 153.435^\circ, \sqrt{3} \operatorname{cis} 206.565^\circ\}$

84) _____

$x^4 = -16$

$-16 + 0i$
 $R = 16$



$16 \operatorname{cis} 180^\circ$

$\sqrt[4]{16}$

$\alpha = \frac{180}{4} + \frac{360}{4}(k)$

$\frac{180}{4} + \frac{360}{4}(1)$

$\frac{180}{4} + \frac{360}{4}(2)$

$\frac{180}{4} + \frac{360}{4}(3)$

219

$2 \operatorname{cis} 45^\circ, 2 \operatorname{cis} 135^\circ$
 $2 \operatorname{cis} 225^\circ, 2 \operatorname{cis} 315^\circ$