

CAT Review for Sem 2 Exam

Name _____

Trig 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. 1) _____

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

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

3) $\cot 30^\circ$ 3) _____

4) $\csc 45^\circ$ 4) _____

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) _____

- A) 45° and 315° B) 135° and 225° C) 225° and 315° D) 45° and 135°

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

- A) 150° and 210° B) 210° and 330° C) 60° and 120° D) 60° and 300°

7) $\csc \theta$ is undefined 7) _____

- A) 90° B) 0° C) 0° and 180° D) 90° and 270°

8) $\tan \theta = 1$ 8) _____

- 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.

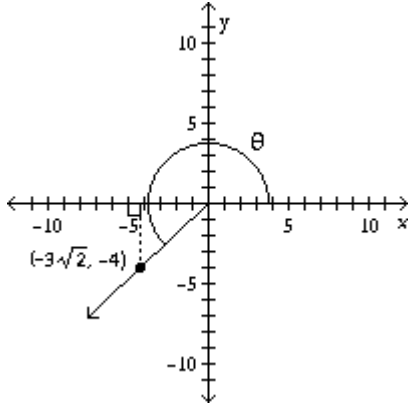
9) 203° 9) _____

10) -136° 10) _____

Find the trigonometric function value for the angle shown.

11) $\sin \theta$

11) _____



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 $\cos \theta$.

12) _____

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

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

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

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

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

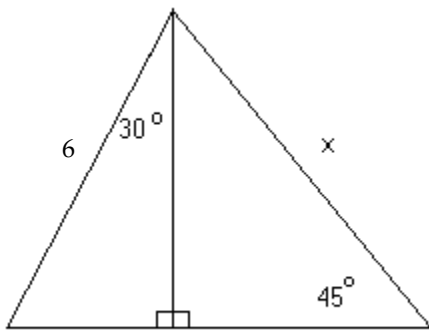
13) A house casts a shadow 27 m long. At the same time, the shadow cast by a 58-centimeter-tall statue is 69 cm long. Find the height of the house.

13) _____

Solve the problem.

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

14) _____



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 254km. Find the lengths of the real-life distances for the two other sides (round to the nearest kilometer).

15) _____

Trig. Ch. 3

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

16) 650°

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

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

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

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

16) _____

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

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

A) -36°

B) $-36\pi^\circ$

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

D) -0.63°

17) _____

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) _____

19) $\cot \theta = 1.2125044$

A) 39.5137415°

B) 34.4379333°

C) 55.5620667°

D) 50.4862585°

19) _____

Find the exact value without using a calculator.

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) _____

21) $\cos 2\pi$

A) -1

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

C) 0

D) 1

21) _____

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

A) $-\sqrt{3}$

B) $\sqrt{3}$

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

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

22) _____

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) _____

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) _____

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

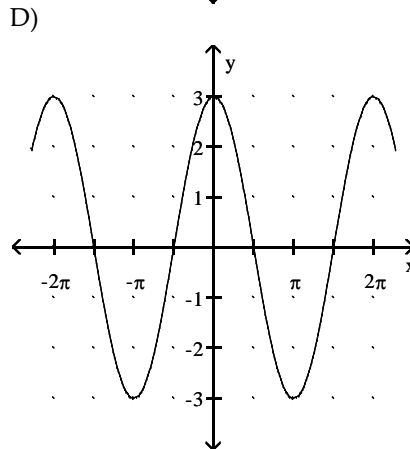
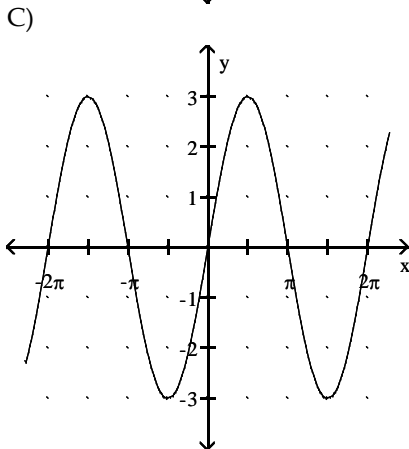
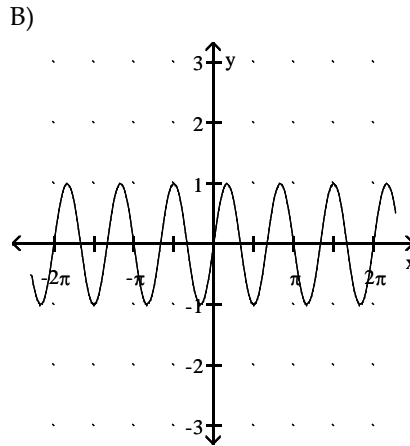
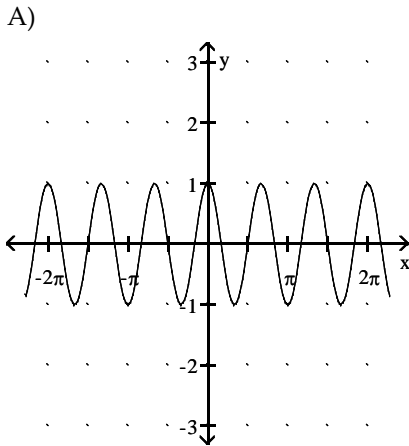
26) Two cities lie on the same north-south line; City A has a bearing of 42°N and City B has a bearing of 34°N . Find the distance between the two cities. (The radius of the earth is 6400 km). Round to the nearest kilometer. 26) _____

- A) 894 km B) 3798 km C) 284 km D) 4691 km

Trig Ch 4

Match the function with its graph.

27) 1) $y = \sin 3x$ 2) $y = 3 \cos x$ 27) _____
 3) $y = 3 \sin x$ 4) $y = \cos 3x$



- 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.

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

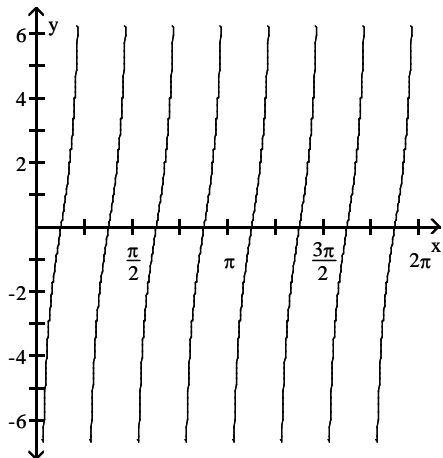
- A) 2 B) 6π C) $\frac{\pi}{2}$ D) $\frac{2\pi}{3}$

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

- 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) 30) _____



- 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) _____

- 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

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

- 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) _____

- A) up $\frac{\pi}{4}$ B) up $\frac{1}{4}$ C) down 3 D) up 4

Give the amplitude or period as requested.

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

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

B) 5

C) 1

D) 2π

34) _____

35) Which graphs intersect the x-axis?

A) $\cos x, \csc x$

B) $\sin x, \sec x$

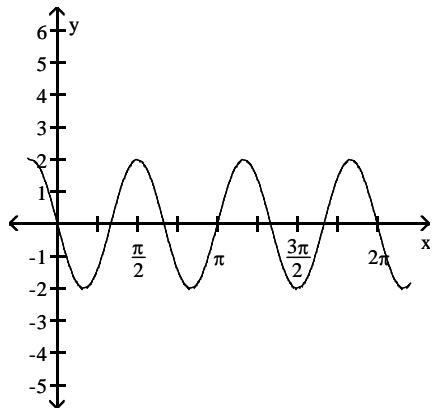
C) $\sin x, \tan x$

D) $\tan x, \sec x$

35) _____

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)



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

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

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

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

36) _____

Chapter 5 Trig

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

37) $\underline{\hspace{1cm}} + \tan^2 x = \sec^2 x$

A) -1

B) $\cos^2 x$

C) $\sin^2 x$

D) 1

37) _____

38) $\sin x = (\underline{\hspace{1cm}})(\cos x)$

A) $\sec x$

B) $\cot x$

C) $\tan x$

D) $\csc x$

38) _____

39) $\cos x = (\cot x)(\underline{\hspace{1cm}})$

A) $\csc x$

B) $\sin x$

C) $\sec x$

D) $\tan x$

39) _____

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) _____

41) $\frac{\sin^2 x - 1}{\cos(-x)}$ 41) _____
 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) _____
 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) $2 \cos^2 75^\circ - 1$ 43) _____
 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) _____
 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) _____
 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) _____
 A) $\frac{4}{5}$ B) $\frac{\sqrt{33}}{4}$ C) $-\frac{5\sqrt{29}}{29}$ D) $-\frac{\sqrt{11}}{6}$

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

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

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

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

Factor the trigonometric expression and simplify.

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

- 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) Identity B) Not an identity

Ch. 6 Trig

Give the degree measure of θ .

51) $\theta = \cos^{-1} \left(\frac{\sqrt{2}}{2} \right)$ 51) _____
A) 45° B) 330° C) 225° D) 30°

Find the exact value of the real number y.

52) $y = \sin^{-1} (0.5)$ 52) _____
A) $\frac{\pi}{3}$ B) $-\frac{\pi}{6}$ C) $-\frac{\pi}{3}$ D) $\frac{\pi}{6}$

53) $y = \cot^{-1} (-1)$ 53) _____
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) $\frac{2\sqrt{5}}{5}$ 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) $\{\pi\}$ B) $\left\{ \frac{\pi}{4}, \frac{7\pi}{4} \right\}$ C) $\left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$ D) $\{2\pi\}$

56) $\cos x = \sin x$

56) _____

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

57) _____

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

58) _____

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

59) _____

A) $\left\{\frac{\pi}{2} + 2n\pi\right\}$

B) $\{2n\pi\}$

C) $\left\{\frac{\pi}{3} + n\pi\right\}$

D) $\{n\pi\}$

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

60) _____

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) $\left\{\frac{\pi}{6} + 2n\pi, \frac{3\pi}{2} + 2n\pi\right\}$

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

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

61) _____

A) $\{0\}$

B) $\left\{\frac{\pi}{4}, \frac{5\pi}{4}\right\}$

C) $\left\{0, \frac{\pi}{4}, \pi\right\}$

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

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

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

62) _____

- 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) $y = 8 \cos 3x$

63) _____

- 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) _____

Solve the triangle.

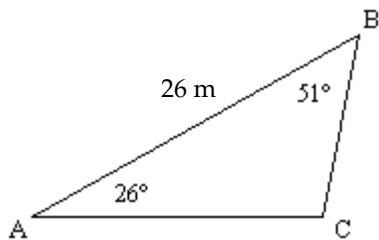
- 65) $B = 34.4^\circ$
 $C = 114.2^\circ$
 $b = 29.50$

65) _____

- 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) $A = 29.4^\circ, a = 47.63, c = 27.20$

66)



66) _____

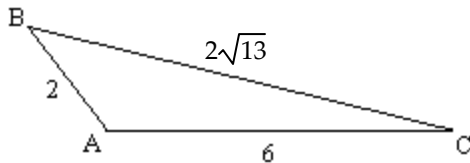
- A) $C = 103^\circ, a = 57.8 \text{ m}, b = 32.6 \text{ m}$
- C) $C = 103^\circ, a = 20.7 \text{ m}, b = 11.7 \text{ m}$

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

Find the indicated angle or side.

73) Find the measure of angle A.

73) _____



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.

74) _____

A) $A = 19.92^\circ, B = 56.34^\circ, C = 103.74^\circ$

B) $A = 23.92^\circ, B = 54.34^\circ, C = 101.74^\circ$

C) $A = 21.92^\circ, B = 56.34^\circ, C = 101.74^\circ$

D) No triangle satisfies the given conditions.

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

75) _____

A) 100 cm^2

B) 97 cm^2

C) 106 cm^2

D) 103 cm^2

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) $\langle 5\sqrt{2}, -5\sqrt{2} \rangle$

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

B) $10; 315^\circ$

C) $10; 135^\circ$

D) $20; 315^\circ$

76) _____

Vector \mathbf{v} has the given magnitude and direction. Find the magnitude of the indicated component of \mathbf{v} .

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

Find the horizontal component of \mathbf{v} .

A) 68.7

B) 109.5

C) 27.9

D) 40.8

77) _____

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

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

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

78) _____

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) _____

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) _____

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) _____

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) _____

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) _____

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) _____

Answer Key

Testname: NEWSEM1 REVIEW2016 WESTBERG

1) $-\frac{\sqrt{5}}{3}$

2) $-\frac{\sqrt{77}}{9}$

3) 1

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

5) D

6) A

7) C

8) D

9) 563° ; -157°

10) 224° ; -496°

11) B

12) B

13) 22.7 m

14) $3\sqrt{6}$

15) 267.9 km

16) B

17) A

18) D

19) A

20) B

21) D

22) B

23) C

24) D

25) A

26) A

27) D

28) A

29) D

30) C

31) B

32) C

33) C

34) A

35) C

36) D

37) D

38) C

39) B

40) B

41) B

42) D

43) D

44) C

45) C

46) C

Answer Key

Testname: NEWSEM1 REVIEW2016 WESTBERG

- 47) B
- 48) D
- 49) D
- 50) A
- 51) A
- 52) D
- 53) C
- 54) A
- 55) A
- 56) B
- 57) B
- 58) C
- 59) D
- 60) B
- 61) D
- 62) A
- 63) D
- 64) B
- 65) C
- 66) B
- 67) C
- 68) C
- 69) C
- 70) D
- 71) A
- 72) A
- 73) C
- 74) C
- 75) B
- 76) B
- 77) D
- 78) C
- 79) B
- 80) C
- 81) D
- 82) B
- 83) D
- 84) B