Student: _____ **Date:** _____	**Instructor:** Robert Brown **Course:** Math 1113 Spring 2018 Dr. Bob Brown, Jr.	**Assignment:** Precalculus Final Exam Review Spring 2018 Dr. Bob

1. Find the intercepts of the function f(x).

$f(x) = x^3 + 3x^2 - 4x - 12$

- **A.** x-intercept: − 2; y-intercept: − 12
- **B.** x-intercepts: − 2, 2, 3; y-intercept: − 12
- **C.** x-intercepts: − 3, − 2, 2; y-intercept: − 12
- **D.** x-intercept: − 3; y-intercept: − 12

ID: 5.5-20

2. Use the Rational Zeros Theorem to find all the real zeros of the polynomial function. Use the zeros to factor f over the real numbers.

$f(x) = x^4 + 21x^2 - 100$

- **A.** $-5, 5; f(x) = (x-5)(x+5)\left(x^2+4\right)$
- **B.** $-2, -5, 2, 5; f(x) = (x-2)(x+2)(x-5)(x+5)$
- **C.** $-2, 2; f(x) = (x-2)(x+2)\left(x^2+25\right)$
- **D.** $2; f(x) = (x-2)^2\left(x^2+25\right)$

ID: 5.5-16

3. Find all zeros of the function and write the polynomial as a product of linear factors.

$f(x) = x^4 + 5x^3 + 15x^2 + 45x + 54$

- **A.** $f(x) = (x+2)(x+3)(x-3i)(x+3i)$
- **B.** $f(x) = \left(x - i\sqrt{6}\right)\left(x + i\sqrt{6}\right)(x-3)(x+3)$
- **C.** $f(x) = (x-2)(x+3)(x-3)(x+3)$
- **D.** $f(x) = (x-1)(x-6)(x-3i)(x+3i)$

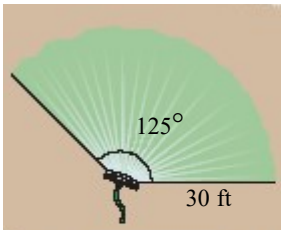
ID: 5.6-19

4. A weight hangs from a rope 20 feet long. It swings through an angle of 27° each second. How far does the weight travel each second? Round to the nearest 0.1 foot.

- 8.7 feet
- 8.1 feet
- 9.0 feet
- 9.4 feet

ID: 7.1-52

5. A water sprinkler sprays water over a distance of 30 feet while rotating through an angle of 125°. What area of lawn receives water?



The area A of the sector is _____ square feet.
(Type an integer or decimal rounded to two decimal places as needed.)

ID: 7.1.95

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6. City A is due north of City B. Find the distance between City A ($36^\circ 4'$ north latitude) and City B ($25^\circ 46'$ north latitude). Assume that the radius of Earth is 3960 miles.

The distance between City A and City B is _____ miles.
(Round to the nearest mile as needed.)

ID: 7.1.107

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7. The angle of inclination from the base of skyscraper A to the top of skyscraper B is approximately 10.7°. If skyscraper B is 1455 feet tall, how far apart are the two skyscrapers? Assume the bases of the two buildings are at the same elevation.

The distance from skyscraper A to skyscraper B is _____ feet.
(Round to two decimal places as needed.)

ID: 9.1.37

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8. A surveyor standing 69 meters from the base of a building measures the angle to the top of the building and finds it to be 38°. The surveyor then measures the angle to the top of the radio tower on the building and finds that it is 49°. How tall is the radio tower? Round your answer to two decimal places.

- **A.** 9.59 m
- **B.** 13.41 m
- **C.** 9.10 m
- **D.** 25.47 m

ID: 9.2-13

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9. The point P, $\left(\frac{5}{8}, \frac{\sqrt{39}}{8}\right)$, on the unit circle that corresponds to a real number t is given. Find the indicated trigonometric function.

Find **tan** t.

- $\frac{\sqrt{39}}{8}$
- $\frac{\sqrt{39}}{5}$
- $\frac{5\sqrt{39}}{39}$
- $\frac{8}{5}$

ID: 7.5-1

10. Find the domain of the rational function.

$f(x) = \frac{x+4}{x^2 - 36x}$

- **A.** $\{x|x \neq -6, 6, -4\}$
- **B.** $\{x|x \neq -6, 6\}$
- **C.** $\{x|x \neq 0, 36\}$
- **D.** all real numbers

ID: 5.3-3

11. Find the vertical, horizontal, and oblique asymptotes, if any, for the given rational function.

$$R(x) = \frac{6x^2 + 5x - 21}{3x + 7}$$

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The vertical asymptote(s) is/are x = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- **B.** There is no vertical asymptote.

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The horizontal asymptote(s) is/are y = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- **B.** There is no horizontal asymptote.

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The oblique asymptote(s) is/are y = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- **B.** There is no oblique asymptote.

ID: 5.2.53

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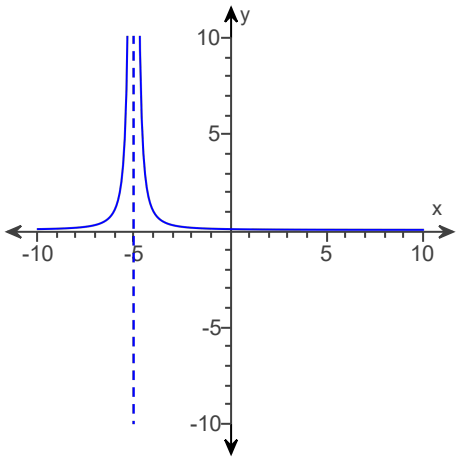
12. Use the graph to determine the domain and range of the function.



- **A.** domain: $\{x|x \geq 0\}$
  range: $\{y|y \neq -5\}$
- **B.** domain: $\{x|x > 0\}$
  range: $\{y|y \neq -5\}$
- **C.** domain: $\{x|x \neq -5\}$
  range: $\{y|y \geq 0\}$
- **D.** domain: $\{x|x \neq -5\}$
  range: $\{y|y > 0\}$

ID: 5.2-9

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13. 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.

Find **csc** B when a = 3 and b = 7.

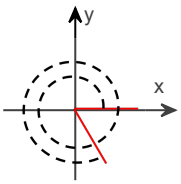
- $\frac{3\sqrt{58}}{58}$
- $\frac{\sqrt{58}}{3}$
- $\frac{\sqrt{58}}{7}$
- $\frac{7\sqrt{58}}{58}$

ID: 7.2-4

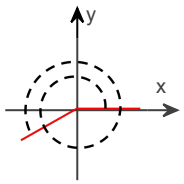
14. Draw an angle of 570°.

Choose the figure that shows an angle of 570°.

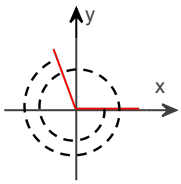
A.



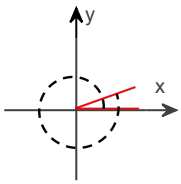
B.



C.



D.



ID: 7.1.15

15. Convert the angle in degrees to radians. Express the answer as multiple of π.

87°

- $\frac{29\pi}{60}$
- $\frac{29\pi}{120}$
- $\frac{29\pi}{30}$
- $\frac{29\pi}{90}$

ID: 7.1-4

16. Convert the angle in radians to degrees.

$\frac{\pi}{3}$

$\frac{\pi}{3} =$ _____ °
(Simplify your answer.)

ID: 7.1.35

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

The function is $y = 3 \sin \frac{1}{2}x$. Find the amplitude.

- $\frac{\pi}{3}$
- 3
- $\frac{3\pi}{2}$
- 4π

ID: 7.6-2

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

Find the period of the function $y = \frac{9}{8} \sin\left(-\frac{6\pi}{7}x\right)$.

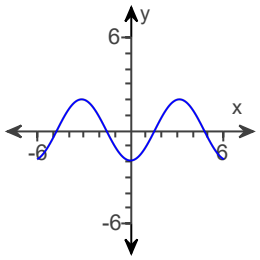
- $\frac{9\pi}{4}$
- $\frac{7}{3}$
- $\frac{4}{9}$
- $\frac{12\pi}{7}$

ID: 7.6-7

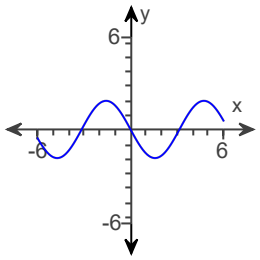
19. Graph the sinusoidal function.

$y = -2\cos(\pi x)$

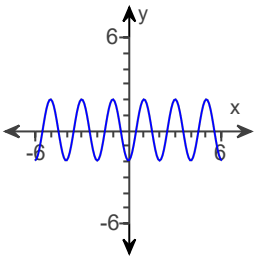
A.



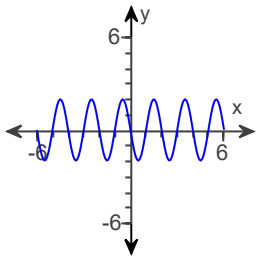
B.



C.

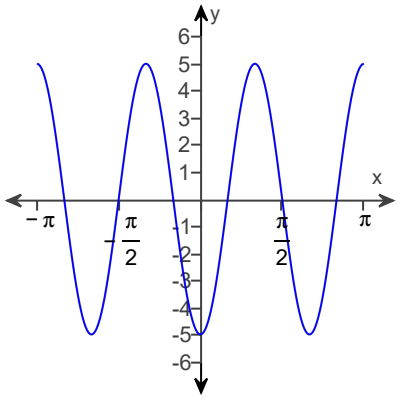


D.



ID: 7.6-15

20. Find an equation for the graph.



A. $y = -5\cos\left(\frac{1}{3}x\right)$

B. $y = -5\cos(3x)$

C. $y = -5\sin(3x)$

D. $y = -5\sin\left(\frac{1}{3}x\right)$

ID: 7.6-44

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

$4\tan\theta - 3 = 0$

A. 0.64,5.64

B. 0.64,3.79

C. 0.64,2.50

D. 0.93,4.07

ID: 8.3-44

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

$2\cos^2\theta - 1 = 0$

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

ID: 8.3-5

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23. 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. Round your answers to two decimal places.

$a = 7, b = 9, B = 49^\circ$

- **A.** one triangle
  $A = 76.01^\circ, C = 54.99^\circ, c = 7.60$
- **B.** one triangle
  $A = 35.94^\circ, C = 95.06^\circ, c = 11.88$
- **C.** two triangles
  $A_1 = 76.01^\circ, C_1 = 54.99^\circ, c_1 = 7.60$ or
  $A_2 = 103.99^\circ, C_2 = 27.01, c_2 = 12.14$
- **D.** no triangle

ID: 9.2-4

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24. Complete the following equation.

$\tan^2\theta - \sec^2\theta = \_\_\_$

$\tan^2\theta - \sec^2\theta =$ _____

ID: 8.4.4

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25. Find the area of the triangle if the sides of the triangle have the approximate lengths 847 miles, 922 miles, and 1303 miles.

- **A.** 1,556,422 sq mi
- **B.** 514,858 sq mi
- **C.** 389,105 sq mi
- **D.** 494,433 sq mi

ID: 9.4-12

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26. 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. Round your answers to two decimal places.

$a = 7, b = 9, B = 49^\circ$

- **A.** one triangle
  $A = 35.94^\circ, C = 95.06^\circ, c = 11.88$
- **B.** one triangle
  $A = 76.01^\circ, C = 54.99^\circ, c = 7.60$
- **C.** two triangles
  $A_1 = 76.01^\circ, C_1 = 54.99^\circ, c_1 = 7.60$ or
  $A_2 = 103.99^\circ, C_2 = 27.01, c_2 = 12.14$
- **D.** no triangle

ID: 9.2-4

27. 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.

$a = 19, b = 15, B = 15^\circ$

- **A.** two triangles
  $A_1 = 19.14^\circ, C_1 = 145.86^\circ, c_1 = 32.53$ or
  $A_2 = 160.86^\circ, C_2 = 4.14^\circ, c_2 = 4.18$
- **B.** one triangle
  $A = 160.86^\circ, C = 4.14^\circ, c = 4.18$
- **C.** one triangle
  $A = 19.14^\circ, C = 145.86^\circ, c = 32.53$
- **D.** no triangle

ID: 9.2-6

28. 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.

$B = 110^\circ, b = 4, a = 24$

- **A.** one triangle
  $A = 54^\circ, C = 15^\circ, c = 30$
- **B.** one triangle
  $A = 56^\circ, C = 15^\circ, c = 32$
- **C.** one triangle
  $A = 55^\circ, C = 15^\circ, c = 28$
- **D.** no triangle

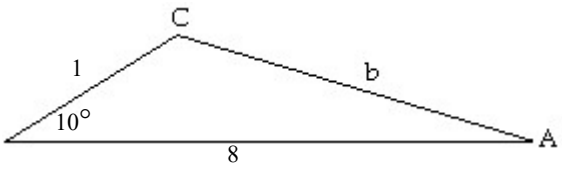
ID: 9.2-7

29. A radio transmission tower is 140 feet tall. How long should a guy wire be if it is to be attached 13 feet from the top and is to make an angle of 35° with the ground? Give your answer to the nearest tenth of a foot.

- **A.** 244.1 ft
- **B.** 170.9 ft
- **C.** 221.4 ft
- **D.** 155.0 ft

ID: 9.1-5

30. Find the area of the triangle. If necessary, round the answer to two decimal places.



- **A.** 2.78
- **B.** 1.39
- **C.** 0.69
- **D.** 3.94

ID: 9.4-2

1. C. x-intercepts: $-3, -2, 2$; y-intercept: -12

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2. C. $-2, 2$; $f(x) = (x-2)(x+2)\left(x^2+25\right)$

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3. A. $f(x) = (x+2)(x+3)(x-3i)(x+3i)$

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4. 9.4 feet

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5. 981.75

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6. 712

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7. 7700.37

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8. D. 25.47 m

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9. $\frac{\sqrt{39}}{5}$

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10. C. $\{x|x \neq 0,36\}$

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11. B. There is no vertical asymptote.

B. There is no horizontal asymptote.

A. The oblique asymptote(s) is/are y = **2x − 3** .
(Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)

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12. D. domain: $\{x|x \neq -5\}$range: $\{y|y > 0\}$

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13. $\frac{\sqrt{58}}{7}$

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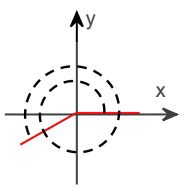
14. 

B.

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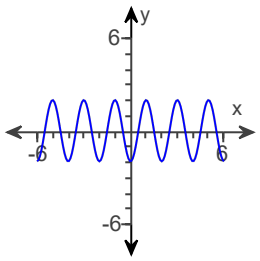
15. $\frac{29\pi}{60}$

16. 60

17. 3

18. $\frac{7}{3}$

19. 

C.

20. B. y = − 5 **cos** (3x)

21. B. 0.64,3.79

22. B. $\left\{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}\right\}$

23. B. one triangle$A = 35.94^\circ$, $C = 95.06^\circ$, $c = 11.88$

24. − 1

25. C. 389,105 sq mi

26. A. one triangle$A = 35.94^\circ$, $C = 95.06^\circ$, $c = 11.88$

27. A. two triangles$A_1 = 19.14^\circ$, $C_1 = 145.86^\circ$, $c_1 = 32.53$ or$A_2 = 160.86^\circ$, $C_2 = 4.14^\circ$, $c_2 = 4.18$

28. D. no triangle

29. C. 221.4 ft

30. C. 0.69
