

Math 0210 Final Review

This review contains more questions than the final exam. On the final exam, all work must be shown to receive full credit.

In problems 1 – 3, perform the indicated operations and simplify if necessary.

1. $\frac{(-8)(4) - (-3)(9) - |4 - 7|}{4 + 6(-2)}$

1. _____

2. $(2 - 5i)(2 + 5i)$

2. _____

3. $3\sqrt{128} - 6\sqrt{8}$

3. _____

4. What is needed when adding or subtracting rational expressions?

4. _____

In problems 5 and 6, perform the indicated operations and simplify if necessary.

5. $\frac{3x - 1}{x^2 + 5x + 6} - \frac{4}{x + 3}$

5. _____

6. $(2a - 7b)^2$

6. _____

7. What is the first step when dividing rational expressions?

7. _____

8. Perform the indicated operation and simplify if necessary.

$$\frac{a^2 - 6ab + 9b^2}{4a^2 - 36b^2} \div \frac{a - 3b}{15a^2 + 45ab}$$

8. _____

Define the following terms.

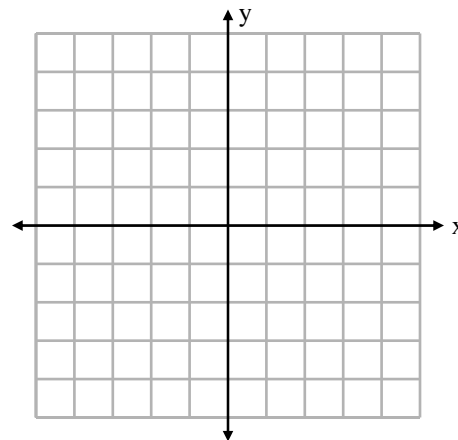
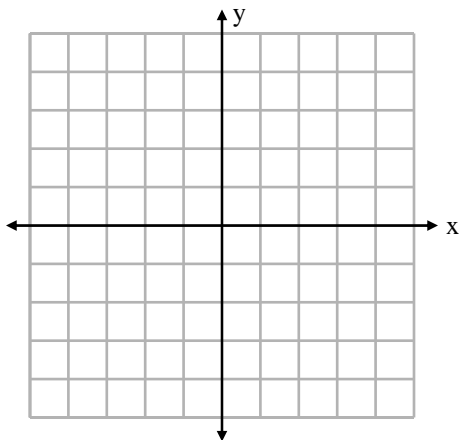
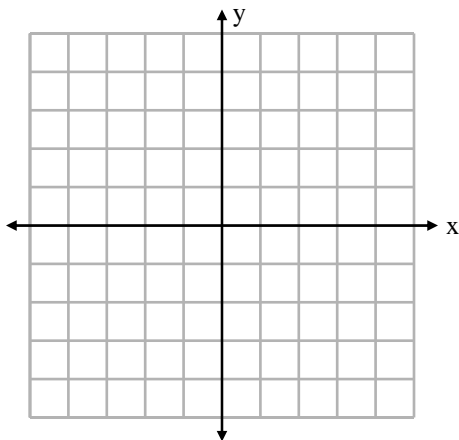
9. Domain

9. _____

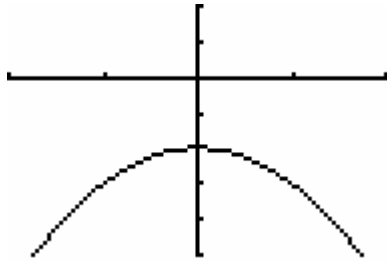
10. Function

10. _____

11. Draw 3 examples of graphs that are functions.



12. State the domain and range of the given graph in interval and set builder notation.



domain (interval notation) _____

range (interval notation) _____

domain (set builder notation) _____

range (set builder notation) _____

13. Which values of x are not in the domain?

$$f(x) = \frac{7}{2x^2 + 5x + 3}$$

13. _____

14. How is $f(x)$ pronounced and what does it really mean?

14. _____

15. If $f(x) = x^2 + 6x - 5$, find $f(-1)$ and $f(a+1)$.

15. $f(-1) =$ _____

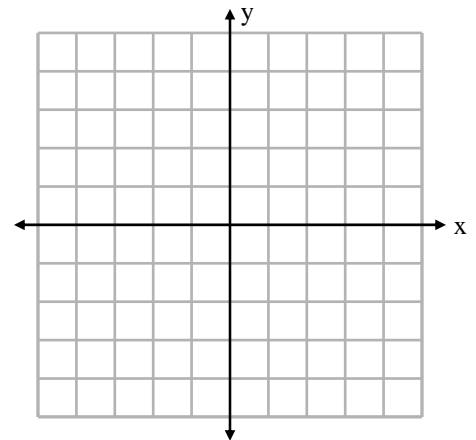
$f(a+1) =$ _____

16. If $f(x) = x^2 + 6$ and $g(x) = 3x - 4$, find $f(7) + g(7)$.

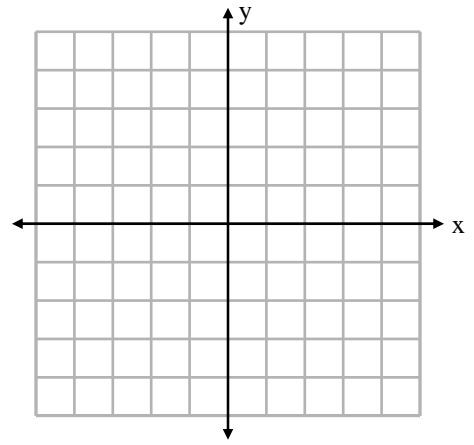
16. _____

17. Describe three methods used to graph linear functions.

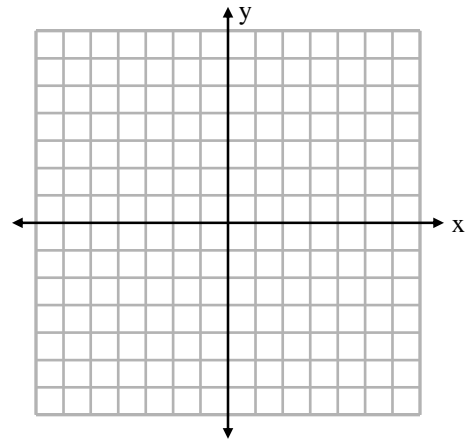
18. Graph $y = 2x - 5$.



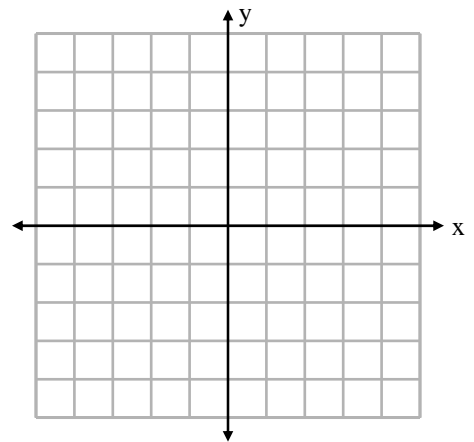
19. Graph $3x - 4y = -12$.



20. Graph $x = 6$.



21. Graph $y = -3$ or $f(x) = -3$.



22. For linear equations in 2 variables, what are the following forms:

a. Standard

a. _____

b. Slope-Intercept

b. _____

c. Point-Slope

c. _____

23. Find the equation of a line passing through points $(-2, 3)$ and $(1, -4)$.

a. Write your final answer in slope-intercept form.

a. _____

b. Write your final answer in standard form.

b. _____

24. Write the equation of a line passing through $(3,1)$ and parallel to the line with equation $x - 2y = -5$. Write your final answer in standard form.

24. _____

25. Solve $|5x - 5| = 10$.

25. _____

26. Solve $|2x - 3| + 4 = 13$.

26. _____

27. Solve $\frac{5}{x} + \frac{1}{3} = \frac{6}{x}$.

27. _____

28. Solve $\frac{x+6}{3x-12} = \frac{5}{x-4} + \frac{2}{3}$

28. _____

Solve by factoring.

29. $x^2 - 2x = 15$

29. _____

30. $3x^2 + 10x - 8 = 0$

30. _____

Solve using the method of your choice.

31. $(x-5)^2 = -9$

31. _____

32. $4x^2 + 49 = 0$

32. _____

33. $3x^2 - 4x = 4$

33. _____

34. $2x^2 - 3x - 5 = 2$

34. _____

Sketch the graph of the quadratic function. Identify the vertex, intercepts, and the equation for the axis of symmetry.

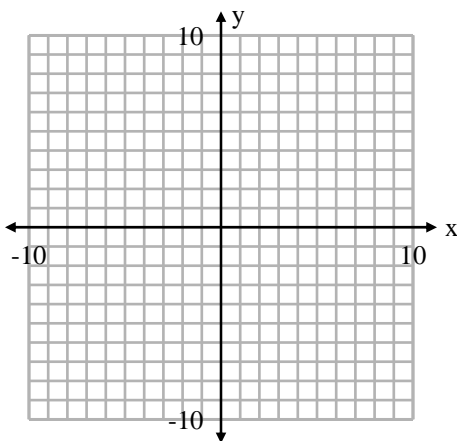
35. $f(x) = x^2 - 2x + 3$

vertex _____

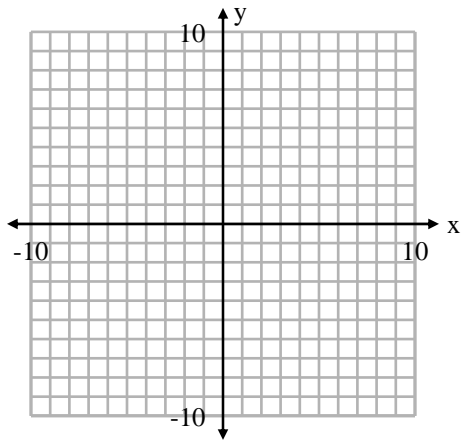
x -intercept(s) _____

y -intercept _____

equation axis of symmetry _____



36. $y + 9 = (x + 3)^2$



vertex _____

x-intercept(s) _____

y-intercept _____

equation axis of symmetry _____

Solve the equation.

37. $\sqrt{2x+1} = 19$

37. _____

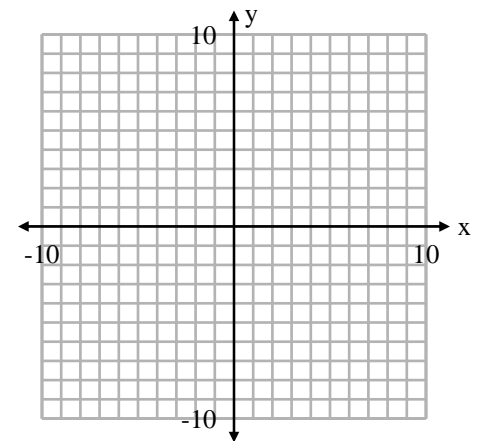
38. $\sqrt{8x-3} + 2 = 11$

38. _____

39. Solve the system of equations using the graphing method.

$3x - 2y = 5$

$2x + y = 8$



40. Solve the system of equations using the elimination method.

$8x = -3y - 4$

$3x + 4y = 10$

40. _____

41. Simplify. Use positive exponents in the reduced answer.

$$\frac{(5x^7)^3(-2x)}{(3x^4)^2(15x^3)^2}$$

41. _____

42. Solve $3^x = 7$. Round the answer to the nearest hundredth.

42. _____

43. Solve $e^x = 14$. Round the answer to the nearest hundredth.

43. _____

44. If $x = -4$, evaluate the expression 2^{x+2} . Leave the answer in exponential form with positive exponents.

44. _____

45. Solve for x if $3^{4x+8} = 81$.

45. _____

Solve the following problems. Define the variable(s), state an equation(s), solve the equation(s), and state the solution in a complete sentence.

46. A grocer has some coffee that sells for \$4 per pound and a second coffee that sells for \$8 per pound. She wants to mix the two coffees to make 50 pounds of coffee that will sell for \$5.60 per pound. How many pounds of each coffee should she use?

47. Mr. Nygen will invest a total of \$15,000 in two accounts, one paying 4% simple annual interest and the other paying 3% simple annual interest. If he wants to earn \$550 annual interest, how much should he invest at each rate?

48. A woman plans to use one-fourth of her 48-foot-by-100-foot rectangular back yard to plant a garden. Find the perimeter of the garden if the length is to be 40 feet greater than the width.

49. If the length of each side of a square is increased by 4 inches, the area of the larger square becomes 9 times greater than the area of the original square. Find the perimeter of the original square.

50. Assume all variables represent positive real numbers. Simplify and rationalize the denominator in the

expression $\sqrt{\frac{242t^9}{u^{11}}}$.

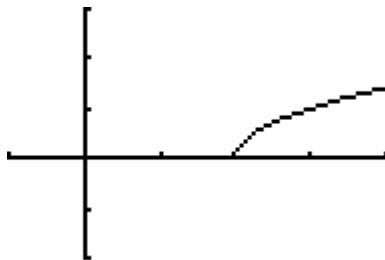
50. _____

51. Write the following expression without using negative exponents.

$$\left(-\frac{8x^3}{27}\right)^{-\frac{1}{3}}$$

51. _____

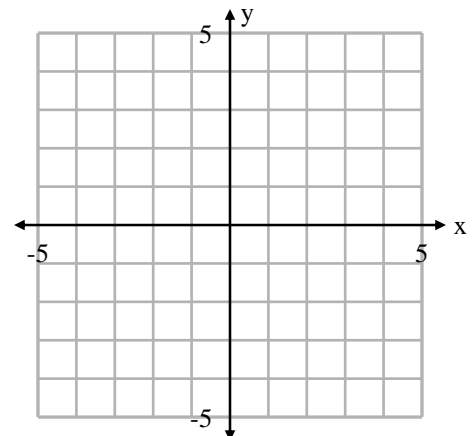
52. From the graph the function $g(x) = \sqrt{x-2}$ determine the domain and range of the function.



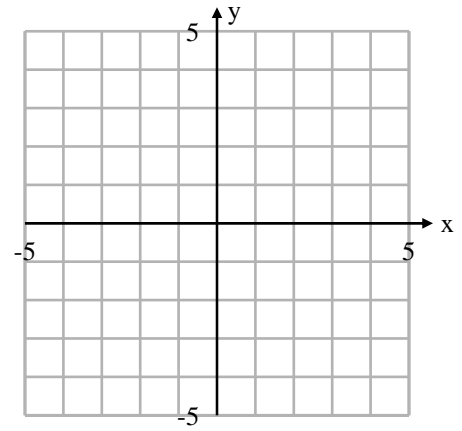
52. Domain _____

Range _____

53. Graph $y \geq 3x - 1$.



54. Graph $2x - y > -5$.



Solve problems 55 – 58 and state the solution in interval notation.

55. $x^2 + 7x + 10 < 0$

55. _____

56. $2x^2 + 18x > -36$

56. _____

57. $|4x + 3| \geq 19$

57. _____

58. $|-3x - 4| < 20$

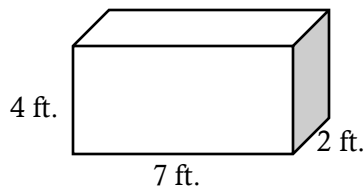
58. _____

59. If a ship leaves port and sails east 56.7 miles and then turns south and sails for 25.9 miles, how far is the ship from port?

59. _____

60. Find the surface area of the right prism .

60. _____



For problems 61 – 63, find the inverse of the given function.

61. $f(x) = 3x - 9$

61. $f^{-1}(x) =$ _____

62. $f(x) = x + 3$

62. $f^{-1}(x) =$ _____

63. $f(x) = -4x + 6$

63. $f^{-1}(x) =$ _____

For problems 64 – 66, perform the indicated operations.

64. $(3 + 5i) - (-1 + 4i)$

64. _____

65. $(8 - 3i)^2$

65. _____

66. $(2 - 9i)(3 + 7i)$

66. _____

67. Solve for x : $\log_6(5x+1) = 2$

67. _____

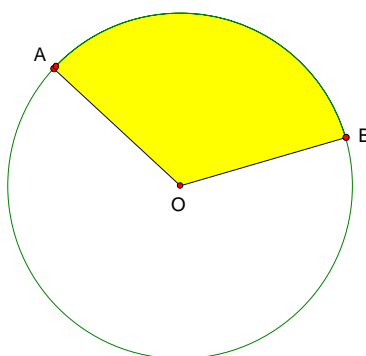
68. Solve for x . If the solutions are complex, write them in $a + bi$ form: $(x-1)^2 = -50$.

68. _____

69. Solve for x . If the solutions are complex, write them in $a + bi$ form: $2x^2 - 6x + 5 = 0$.

69. _____

70. In the figure shown, \overline{OB} and \overline{OA} are radii of the circle, $m\angle AOB = 120^\circ$ and $AO = 5$ cm. Find the following. BE SURE TO USE THE CORRECT UNITS OF MEASURE.



a. Circumference of the circle. Leave the answers in terms of π . a. _____

b. Area of the circle. Leave the answers in terms of π . b. _____

c. Length of \widehat{AB} . Round the answer to the nearest tenth. c. _____

d. Perimeter of the shaded sector. Round the answer to the nearest tenth. d. _____

e. Area of the shaded sector. Round the answer to the nearest tenth. e. _____

71. If the area of a circle is 144π cm², find the **exact** circumference of the circle.

71. _____

72. Match the following: Use each formula only once.

- A. ____ volume of rectangular solid
- B. ____ surface area of rectangular solid
- C. ____ volume of sphere
- D. ____ surface area of sphere
- E. ____ volume of right circular cylinder
- F. ____ surface area of right circular cylinder
- G. ____ volume of right circular cone
- H. ____ surface area of right circular cone
- I. ____ volume of regular right pyramid
- J. ____ surface area of right regular pyramid

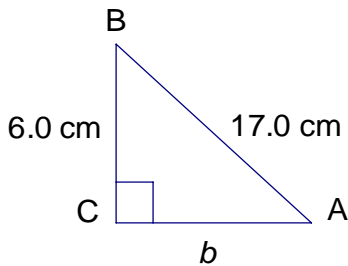
- a. $\pi rl + \pi r^2$ or $\frac{1}{2}Cl + B$ or $L + B$
- b. $2\pi rh + 2\pi r^2$ or $Ph + 2B$ or $L + 2B$ or $Ch + 2B$
- c. lwh or Bh
- d. sum area of sides + B or $\frac{1}{2}Pl + B$ or $L + B$
- e. $2wl + 2hl + 2hw$ or $Ph + 2B$ or $L + 2B$
- f. $\frac{1}{3}\pi r^2 h$ or $\frac{1}{3}Bh$
- g. $\frac{4}{3}\pi r^3$
- h. $\pi r^2 h$ or Bh
- i. $4\pi r^2$
- j. $\frac{1}{3}Bh$

73. Find the approximate volume of an ice cream cone used for display that has a diameter of 14 inches and height of 21 inches. Round the answer to the tenths place. Label the answer correctly.

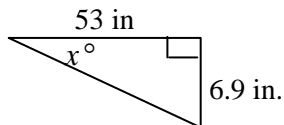
73. _____

74. Solve the given triangle. Round each answer to the nearest tenth of a unit.

74. _____

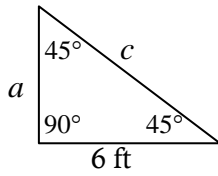


75. Use a calculator to find the value of x to the nearest tenth of a degree.



75. _____

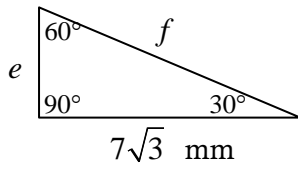
76. Find the values for a and c in the given figure. Round to the nearest tenth if necessary.



76. $a =$ _____

$c =$ _____

77. Find the values for e and f in the given figure. Round to the nearest tenth if necessary.



77. $e =$ _____

$f =$ _____