

1) Find  $f(-1)$  when  $f(x) = 4x^3 - 2x^2 - 8x + 3$  1) \_\_\_\_\_

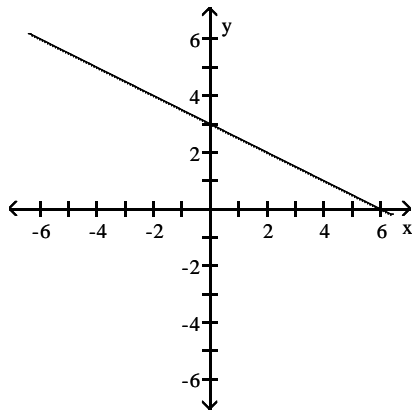
2) Given  $f(x) = \frac{x+2}{x-3}$  and  $g(x) = \frac{x-1}{x+4}$ , find the sum,  $(f+g)(x)$ . 2) \_\_\_\_\_

3) Given  $f(x) = -6x^3 + 9x^2 + 4$  and  $g(x) = -5x^3 + 2x - 5$ , find the difference,  $(f-g)(x)$  3) \_\_\_\_\_

4) Given  $f(x) = x - 4$  and  $g(x) = 3x + 4$ , find the product,  $(f \cdot g)(x)$  4) \_\_\_\_\_

5) Given  $f(x) = \frac{4x^2 - 9}{x^2 - 9}$  and  $g(x) = \frac{2x - 3}{x - 3}$ , find the quotient,  $\left(\frac{f}{g}\right)(x)$  5) \_\_\_\_\_

6) Which of the functions is graphed below? 6) \_\_\_\_\_



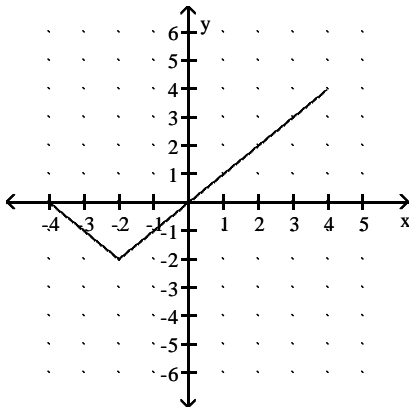
$$f(x) = \frac{1}{2}x - 3$$

$$f(x) = -\frac{1}{2}x + 3$$

$$f(x) = \frac{1}{2}x + 3$$

$$f(x) = -2x + 3$$

7) Find the range. 7) \_\_\_\_\_



8) Find the domain of the function:  $f(x) = \frac{x-5}{x^2-6x+9}$ . Write your answer using set-builder notation 8) \_\_\_\_\_

*notation*

- 9) Find the domain of the difference of  $f$  and  $g$ ,  $(f - g)(x)$ :  $f(x) = \frac{2}{x - 8}$ ,  $g(x) = -6x - 5$  9) \_\_\_\_\_
- 10) Find the domain of the quotient of  $f$  and  $g$ ,  $(f/g)(x)$ :  $f(x) = \frac{2}{x - 12}$ ,  $g(x) = 4x - 5$  10) \_\_\_\_\_
- 11) The weight  $W$  of an object on the Moon varies directly as the weight  $E$  on earth. A person who weighs 145 lb on earth weighs 29 lb on the Moon. How much would a 140-lb person weigh on the Moon? *Round to one decimal place, if necessary* 11) \_\_\_\_\_
- 12) The volume  $V$  of a gas varies inversely as the pressure  $P$  on it. The volume of a gas is  $230 \text{ cm}^3$  under a pressure of  $21 \text{ kg/cm}^2$ . What will be its volume under a pressure of  $35 \text{ kg/cm}^2$ ? 12) \_\_\_\_\_
- 13) Solve:  $4x + y = 10$   
 $3x + 2y = -5$  13) \_\_\_\_\_
- The value of the  $y$  coordinate is...
- 14) Solve:  $6x - 5y = -3$   
 $-24x + 20y = 12$  14) \_\_\_\_\_
- 15) A sum of money amounting to \$4.25 consists of dimes and quarters. If there are 23 coins in all, how many are quarters? 15) \_\_\_\_\_
- 16) Walt made an extra \$5000 last year from a part-time job. He invested part of the money at 6% and the rest at 10%. He made a total of \$420 in interest. How much was invested at 10%? 16) \_\_\_\_\_
- 17) Find the total-profit function for the total-cost and total-revenue functions.  
 $C(x) = 45x + 40,000$   
 $R(x) = 100x$  17) \_\_\_\_\_
- 18) Find the break even point ( $x$ -coordinate only) for the given total-cost and total-revenue functions. *Round to the nearest whole unit.*  
 $C(x) = 20x + 34,000$   
 $R(x) = 150x$  18) \_\_\_\_\_
- 19) Find the equilibrium point for the pair of demand and supply functions.  
 $D(p) = 3000 - 14p$   
 $S(p) = 2440 + 2p$  19) \_\_\_\_\_
- 20) Graph the solution:  $x < 3$  or  $x \geq 6$  20) \_\_\_\_\_
- 21) Solve:  $-3x \geq 6$  and  $x + 4 > 5$  Write your answer using interval notation 21) \_\_\_\_\_
- 22) Solve:  $|b - 2| = 5$  22) \_\_\_\_\_

23) Solve:  $|2x + 3| < 15$  Write your answer using interval notation

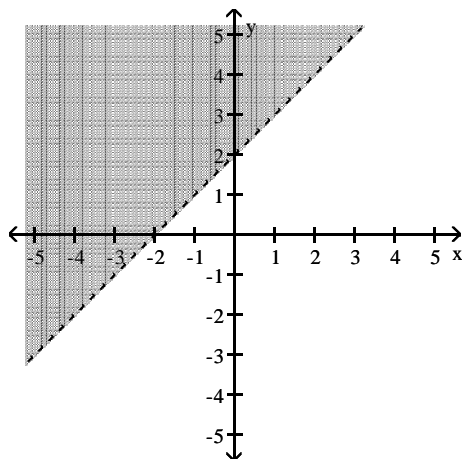
23) \_\_\_\_\_

24) Graph the solution:  $|2n - 4| > 2$

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

25) Match the graph below with the corresponding linear inequality  
(Note: the boundary line is drawn as a dashed line)

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



$y > x + 2$

$y \leq x + 2$

$y < x + 2$

$y \geq x + 2$

26) Find the domain of the function:  $f(x) = \sqrt{x - 2}$  Write your answer using set-builder notation

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

27) Use rational exponents to simplify:  $\sqrt[3]{x^2} \cdot \sqrt[4]{x}$  Write your answer using rational exponents

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

28) Simplify:  $\sqrt{20x^2y}$  Assume that all expressions under radicals represent nonnegative numbers.

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

29) Simplify:  $\sqrt{128} + 5\sqrt{18} - 5\sqrt{50}$

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

30) Simplify:  $(\sqrt{3} - 4)(\sqrt{5} - 4)$

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

31) Simplify:  $(2 + \sqrt{7})^2$

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

32) Solve:  $\sqrt{4x - 9} - 2 = 0$

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

33) Solve:  $y^{1/3} - 3 = 1$

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

34) Simplify:  $i^{14}$  where  $i$  is the "imaginary number"

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

35) Simplify:  $i^{19}$

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

36) Solve:  $(3s + 4)^2 = 9$

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

37) Solve:  $5x^2 + 2x = 1$

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

38) Let  $f(x) = x^2 - 8x + 16$ . Find  $x$  so that  $f(x) = 22$ .

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

39) Find the  $x$ -intercepts:  $f(x) = 2x^2 + 5x - 3$

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

40) Sue rowed her boat across Lake Bend and back in 3 hours. If her rate returning was 2 mph less than the rate going, and if the distance each way was 7 miles, find her rate going.  
Round to one decimal place, if necessary

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

41) Solve:  $3 + \frac{10}{x^2} = \frac{-11}{x}$

41) \_\_\_\_\_

42) Solve for  $r$ :  $A = \frac{1}{3}\pi r^2$  (assume that all variables represent nonnegative numbers.)

42) \_\_\_\_\_

43) Find the  $y$ -intercept:  $f(x) = 4x^2 + 10x + 3$

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

44) Find the vertex:  $f(x) = -2x^2 + 20x - 47$

44) \_\_\_\_\_

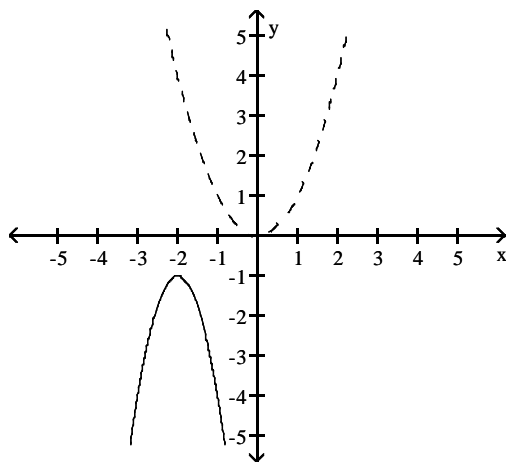
45) The number of mosquitoes  $M(x)$ , in millions, in a certain area depends on the June rainfall  $x$ , in inches: What amount of rainfall produces the maximum number of mosquitoes?

45) \_\_\_\_\_

$$M(x) = -x^2 + 18x$$

46) The graph below is best represented by which function?  
(Note: the dashed curve,  $y = x^2$  is provided for reference)

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



$$f(x) = -3(x-2)^2 - 1$$

$$f(x) = -3(x+2)^2 - 1$$

$$f(x) = \frac{1}{3}(x+2)^2 - 1$$

$$f(x) = -\frac{1}{3}(x-2)^2 + 1$$

47) Find the inverse, if it exists:  $f(x) = \sqrt[3]{\frac{x-1}{2}}$

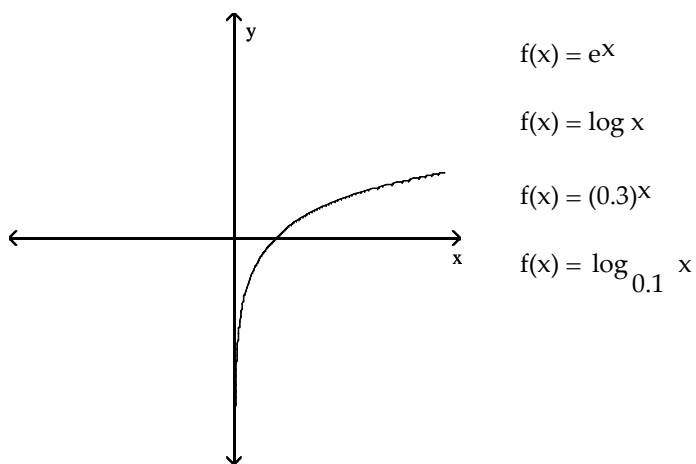
47) \_\_\_\_\_

48) Given  $f(x) = 3x^2 - 5$  and  $g(x) = \frac{5}{x}$ , find  $f \circ g(x)$ .

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

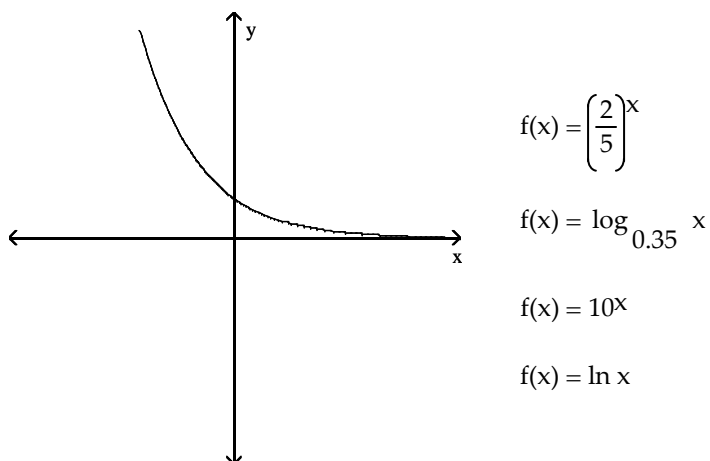
49) The graph below is best represented by which function?

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



50) The graph below is best represented by which function?

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



51) Solve:  $\log_9 x = \frac{1}{2}$

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

52) Express in terms of  $\log a$ ,  $\log b$  and  $\log c$ :  $\log \frac{a^4 c^2}{b^3}$

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

53) Solve:  $5^x = 7$  (Round to the nearest ten-thousandth.) 53) \_\_\_\_\_

54) Suppose that \$750 is invested at 6% annual interest, compounded continuously. How much will be in the account in 4 years if no money is withdrawn? 54) \_\_\_\_\_

*Hint: Use  $A = P(1+i)^t$  or  $A = Pe^{rt}$ , whichever is more appropriate.*

55) Suppose that \$10,000 is invested at an interest rate of 5.8% per year, compounded continuously. What is the doubling time? 55) \_\_\_\_\_

*Hint: Use  $A = P(1+i)^t$  or  $A = Pe^{rt}$ , whichever is more appropriate.*

# Answer Key

Testname: PRACTICE FINAL EXAM (MATH 11000)

1) 5

2)  $\frac{2x^2 + 2x + 11}{(x - 3)(x + 4)}$

3)  $-x^3 + 9x^2 - 2x + 9$

4)  $3x^2 - 8x - 16$

5)  $\frac{2x + 3}{x + 3}$

6)  $f(x) = -\frac{1}{2}x + 3$

7)  $\{y \mid -2 \leq y \leq 4\}$

8)  $\{x \mid x \neq 3\}$

9)  $\{x \mid x \text{ is a real number and } x \neq 8\}$

10)  $\left\{x \mid x \text{ is a real number and } x \neq 12 \text{ and } x \neq \frac{5}{4}\right\}$

11) 28 lb

12) 138 cm<sup>3</sup>

13) -10

14) Infinite number of solutions

15) 13 quarters

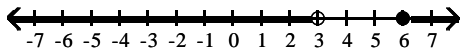
16) \$3000

17)  $P(x) = 55x - 40,000$

18) 262

19) (\$35, 2510)

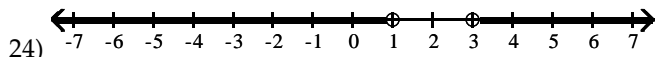
20)



21)  $\emptyset$ , no solution

22) 7, -3

23)  $(-9, 6)$



24)

25)  $y > x + 2$

26) None of these

27)  $x^{11/12}$

28)  $2x\sqrt{5y}$

29)  $-2\sqrt{2}$

30)  $\sqrt{15} - 4\sqrt{3} - 4\sqrt{5} + 16$

31)  $11 + 4\sqrt{7}$

32)  $\frac{13}{4}$

33) 64

34) -1

35) -i

36)  $-\frac{1}{3}, -\frac{7}{3}$

37)  $\frac{-1 \pm \sqrt{6}}{5}$

38)  $4 + \sqrt{22}, 4 - \sqrt{22}$

Answer Key

Testname: PRACTICE FINAL EXAM (MATH 11000)

39)  $(-3, 0)$  and  $(\frac{1}{2}, 0)$

40) 5.9 mph

41)  $-\frac{5}{3}, -2$

42)  $r = \sqrt{\frac{3A}{\pi}}$

43)  $(0, 3)$

44)  $(5, 3)$

45) 9 inches

46)  $f(x) = -3(x+2)^2 - 1$

47)  $f^{-1}(x) = 2x^3 + 1$

48)  $\frac{75}{x^2} - 5$

49)  $f(x) = \log x$

50)  $f(x) = \left(\frac{2}{5}\right)^x$

51) 3

52)  $4\log a - 3\log b + 2\log c$

53) 1.2091

54) \$953.43

55) 12 years