

Name: Last \_\_\_\_\_ First \_\_\_\_\_

**You must show your work and/or provide explanations for your answers for all questions. Otherwise, no credit will be given.**

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Find an equation for the line with the given properties.**

- 1) Parallel to the line  $2x + 9y = 24$ ; containing the point  $(3, -6)$  1) \_\_\_\_\_  
 A)  $3x + 9y = 24$       B)  $2x + 9y = -48$       C)  $2x - 9y = -48$       D)  $9x + 2y = -6$

**Perform the indicated operations and simplify the result. Leave the answer in factored form.**

- 2)  $\frac{6}{x} + \frac{8}{x-3}$  2) \_\_\_\_\_  
 A)  $\frac{14x-18}{x(3-x)}$       B)  $\frac{14x-18}{x(x-3)}$       C)  $\frac{18x-14}{x(x-3)}$       D)  $\frac{18x-14}{x(3-x)}$

**Find the real solutions, if any, of the equation. Use the quadratic formula.**

- 3)  $8x^2 - x + 4 = 0$  3) \_\_\_\_\_  
 A)  $\left\{\frac{-1 - \sqrt{129}}{16}, \frac{1 + \sqrt{129}}{16}\right\}$       B)  $\left\{\frac{-1 + \sqrt{129}}{16}, \frac{1 + \sqrt{129}}{16}\right\}$   
 C)  $\left\{\frac{-1 - \sqrt{129}}{16}, \frac{-1 + \sqrt{129}}{16}\right\}$       D) no real solution

**Solve the equation.**

- 4)  $9x - 18 = 3x - 48$  4) \_\_\_\_\_  
 A)  $\{-5\}$       B)  $\{-8\}$       C)  $\{8\}$       D)  $\{5\}$

**Find the vertex and axis of symmetry of the graph of the function.**

- 5)  $f(x) = -7x^2 - 14x - 3$  5) \_\_\_\_\_  
 A)  $(-2, -17)$ ;  $x = -2$       B)  $(1, -24)$ ;  $x = 1$   
 C)  $(2, -59)$ ;  $x = 2$       D)  $(-1, 4)$ ;  $x = -1$

**For the given functions  $f$  and  $g$ , find the requested function and state its domain.**

- 6)  $f(x) = 16 - x^2$ ;  $g(x) = 4 - x$  6) \_\_\_\_\_  
 Find  $f + g$  and  $(f + g)(-2)$   
 A)  $(f + g)(x) = 4 + x$ ;  $\{x \mid x \neq -4\}$ ,  $(f + g)(-2) = 2$   
 B)  $(f + g)(x) = -x^2 - x + 20$ ; all real numbers,  $(f + g)(-2) = 18$   
 C)  $(f + g)(x) = -x^2 + x + 12$ ; all real numbers,  $(f + g)(-2) = 6$   
 D)  $(f + g)(x) = x^3 - 4x^2 - 16x + 64$ ; all real numbers,  $(f + g)(-2) = 72$

**Find the quotient and the remainder.**

7)  $16x^3 - 16x^2 - 21x + 15$  divided by  $4x + 1$

A)  $4x^2 - 5x - 4$ ; remainder 19

C)  $x^2 - 4$ ; remainder -5

B)  $4x^2 - 5x - 4$ ; remainder 22

D)  $4x^2 - 5x - 4$ ; remainder 0

7) \_\_\_\_\_

**Form a polynomial whose zeros and degree are given.**

8) Zeros: -3, -2, 2; degree 3

A)  $f(x) = x^3 - 3x^2 - 4x + 12$  for  $a = 1$

C)  $f(x) = x^3 + 3x^2 + 4x + 12$  for  $a = 1$

B)  $f(x) = x^3 - 3x^2 + 4x - 12$  for  $a = 1$

D)  $f(x) = x^3 + 3x^2 - 4x - 12$  for  $a = 1$

8) \_\_\_\_\_

9) Zeros: 0, -6, 5; degree 3

A)  $f(x) = x^3 + x^2 + 30x$  for  $a = 1$

C)  $f(x) = x^3 + x^2 - 30x$  for  $a = 1$

B)  $f(x) = x^3 + x^2 + x - 30$  for  $a = 1$

D)  $f(x) = x^3 + x^2 + x + 30$  for  $a = 1$

9) \_\_\_\_\_

**The function  $f$  is one-to-one. Find its inverse.**

10)  $f(x) = 5x - 3$

A)  $f^{-1}(x) = \frac{x+3}{5}$

B)  $f^{-1}(x) = \frac{x-3}{5}$

C)  $f^{-1}(x) = \frac{x}{5} + 3$

D)  $f^{-1}(x) = \frac{x}{5} - 3$

10) \_\_\_\_\_

11)  $f(x) = (x + 6)^3$

A)  $f^{-1}(x) = \sqrt[3]{x} - 216$

C)  $f^{-1}(x) = \sqrt[3]{x} - 6$

B)  $f^{-1}(x) = \sqrt{x} - 6$

D)  $f^{-1}(x) = \sqrt[3]{x} + 6$

11) \_\_\_\_\_

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

**Solve the problem.**

12) Instruments on a satellite measure the amount of power generated by the satellite's power supply. The time  $t$  and the power  $P$  can be modeled by the function  $P = 50e^{-t/300}$ , where  $t$  is in days and  $P$  is in watts. How much power will be available after 378 days? Round to the nearest hundredth.

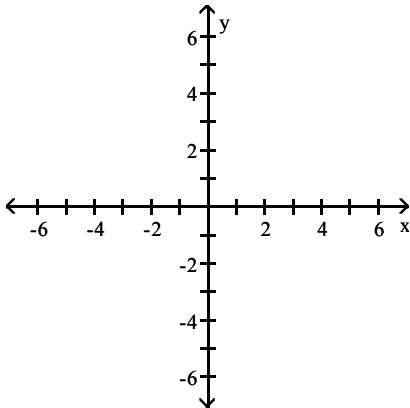
12) \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

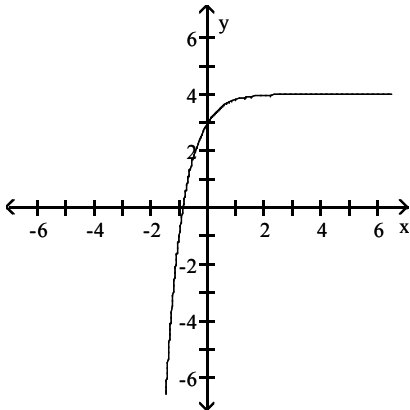
Use transformations to graph the function. Determine the domain, range, and horizontal asymptote of the function.

13)  $f(x) = 5^{-x} + 4$

13) \_\_\_\_\_

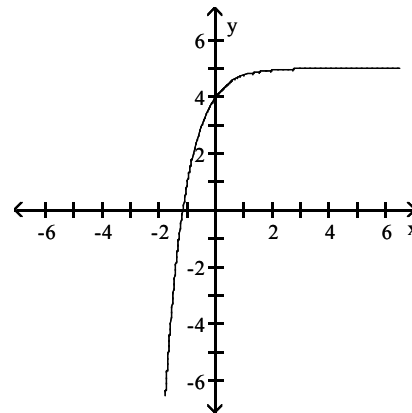


A)



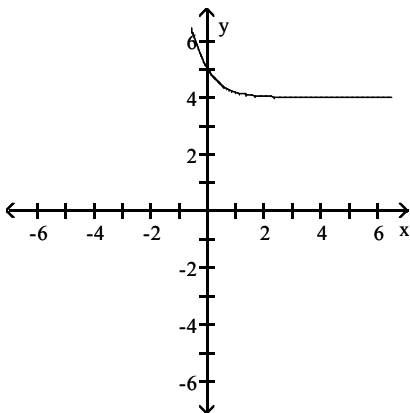
domain of  $f: (-\infty, \infty)$ ; range of  $f: (4, \infty)$   
horizontal asymptote:  $y = 4$

B)



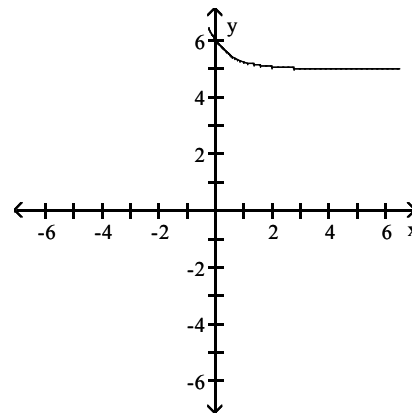
domain of  $f: (-\infty, \infty)$ ; range of  $f: (5, \infty)$   
horizontal asymptote:  $y = 5$

C)



domain of  $f: (-\infty, \infty)$ ; range of  $f: (4, \infty)$   
horizontal asymptote:  $y = 4$

D)



domain of  $f: (-\infty, \infty)$ ; range of  $f: (5, \infty)$   
horizontal asymptote:  $y = 5$

**Solve the equation.**

14)  $2x^2 - 3 = 64$

14) \_\_\_\_\_

A) {6}

B) {3}

C)  $\{\sqrt{35}, -\sqrt{35}\}$

D) {3, -3}

**Change the logarithmic expression to an equivalent expression involving an exponent.**

15)  $\log_4 64 = 3$

15) \_\_\_\_\_

A)  $64^3 = 4$

B)  $4^3 = 64$

C)  $3^4 = 64$

D)  $4^{64} = 3$

**Change the exponential expression to an equivalent expression involving a logarithm.**

16)  $4^{5/2} = 32$

16) \_\_\_\_\_

A)  $\log_4 32 = \frac{5}{2}$

B)  $\frac{\log_2 32}{\log_5 4} = 4$

C)  $\log_{32} 4 = \frac{5}{2}$

D)  $\log_5 4 = \frac{5}{2}$

17)  $5^{-2} = \frac{1}{25}$

17) \_\_\_\_\_

A)  $\log_{-2} \frac{1}{25} = 5$

B)  $\log_{1/25} 5 = -2$

C)  $\log_5 \frac{1}{25} = -2$

D)  $\log_5 -2 = \frac{1}{25}$

**Use a calculator to evaluate the expression. Round your answer to three decimal places**

18)  $\frac{\log 9 + \log 4}{\ln 3 - \ln 8}$

18) \_\_\_\_\_

A) -0.359

B) -3.654

C) 0.490

D) -1.587

**Solve the problem.**

19) Find a so that the graph of  $f(x) = \log_a x$  contains the point (13, 16).

19) \_\_\_\_\_

A)  $\sqrt[16]{13}$

B)  $\frac{13}{16}$

C)  $\sqrt[13]{16}$

D)  $\frac{16}{13}$

20)  $f(x) = 3^x + 2$  and  $g(x) = 3^{-x} + 4$ .

20) \_\_\_\_\_

Find the point of intersection of the graphs of f and g by solving  $f(x) = g(x)$ .

A) (1, 27)

B) (27, 1)

C) (1, 9)

D) (9, 1)

21) The population of a particular country was 29 million in 1985; in 1997, it was 38 million. The exponential growth function  $A = 29e^{kt}$  describes the population of this country t years after 1985.

21) \_\_\_\_\_

Use the fact that 12 years after 1985 the population increased by 9 million to find k to three decimal places.

A) 0.023

B) 0.183

C) 0.033

D) 0.584

**Use a graphing calculator to solve the equation. Round your answer to two decimal places.**

22)  $e^x = x^2 - 1$

22) \_\_\_\_\_

A) {-0.71}

B) {2.54}

C) {-1.15}

D) {0}

**Find the amount that results from the investment.**

- 23) \$480 invested at 12% compounded quarterly after a period of 7 years 23) \_\_\_\_\_  
A) \$618.21                      B) \$1098.21                      C) \$1061.13                      D) \$1066.22

**Solve the problem.**

- 24) Kimberly invested \$4000 in her savings account for 8 years. When she withdrew it, she had \$5085.00. Interest was compounded continuously. What was the interest rate on the account? Round to the nearest tenth of a percent. 24) \_\_\_\_\_  
A) 2.9%                      B) 3.1%                      C) 3%                      D) 3.15%

- 25) Suppose that \$4000 is invested at an interest rate of 5.6% per year, compounded continuously. What is the doubling time? 25) \_\_\_\_\_  
A) 13.4 yr                      B) 2 yr                      C) 12.4 yr                      D) 11.4 yr

**Solve the inequality. Express your answer using interval notation.**

- 26)  $|5x + 2| > 3$  26) \_\_\_\_\_  
A)  $(-1, \frac{1}{5})$                       B)  $[-1, \frac{1}{5}]$   
C)  $(-\infty, -1]$  or  $[\frac{1}{5}, \infty)$                       D)  $(-\infty, -1)$  or  $(\frac{1}{5}, \infty)$

- 27) In the decimal number system (base 10), what is the value of the binary number 10101011 27) \_\_\_\_\_  
A) 171                      B) 10,101,011                      C) 255                      D) 185

**Solve the problem.**

- 28) A bank loaned out \$61,000, part of it at the rate of 15% per year and the rest at a rate of 7% per year. If the interest received was \$6430, how much was loaned at 15%? 28) \_\_\_\_\_  
A) \$28,000                      B) \$27,000                      C) \$34,000                      D) \$33,000

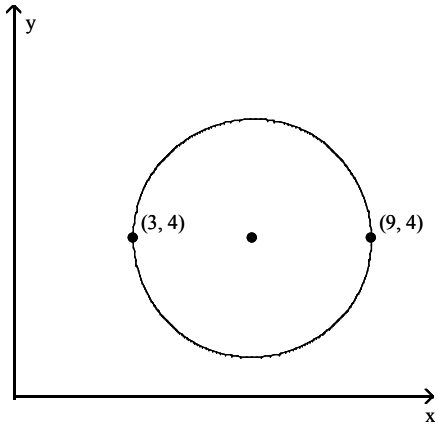
**Find the distance  $d(P_1, P_2)$  between the points  $P_1$  and  $P_2$ .**

- 29)  $P_1 = (1, -3)$ ;  $P_2 = (-4, -15)$  29) \_\_\_\_\_  
A) 14                      B) 26                      C) 13                      D) 169

Write the standard form of the equation of the circle.

30)

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



A)  $(x + 6)^2 + (y + 4)^2 = 3$

B)  $(x - 6)^2 + (y - 4)^2 = 3$

C)  $(x + 6)^2 + (y + 4)^2 = 9$

D)  $(x - 6)^2 + (y - 4)^2 = 9$

Solve the problem.

31) The owner of a video store has determined that the cost  $C$ , in dollars, of operating the store is approximately given by  $C(x) = 2x^2 - 26x + 770$ , where  $x$  is the number of videos rented daily. Find the lowest cost to the nearest dollar.

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

A) \$432

B) \$601

C) \$686

D) \$855

## Answer Key

Testname: MATH1111-FINAL-PRACTICE

- 1) B
- 2) B
- 3) D
- 4) A
- 5) D
- 6) B
- 7) A
- 8) D
- 9) C
- 10) A
- 11) C
- 12) 14.18 watts
- 13) C
- 14) D
- 15) B
- 16) A
- 17) C
- 18) D
- 19) A
- 20) A
- 21) A
- 22) C
- 23) B
- 24) C
- 25) C
- 26) D
- 27) A
- 28) B
- 29) C
- 30) D
- 31) C