Exam 1 PreparationCh 1, 2, & 4 v02
There will be twenty questions chosen from below.
No Book/No Notes/No Phone/No Ipod/Yes Calculator /55 minutes

Name_____

Solve the problem.

1) Some values for a relation are given in the table. Is the relation a function?

x	y
1	2
2	5
3	8
3	11
4	14

2) Some values for a relation are given in the table. Is the relation a function?

x	y
5	3
6	4
7	6
8	6
9	15

Determine whether the relation is a function.

3) $y = 2x + 3$

4) $y = x^3$

5) $x = y^4$

6) $x = y^2$

7) $3x + 3y - 5 = 8 + 3(y - 1)$

8) $5x + 7y - 4 = 8 + 7(y - 1)$

Evaluate the function at the given value of x.

9) $f(x) = 2x + 6$, $f(2)$

10) $f(x) = \frac{x - 4}{5x + 9}$, $f(-2)$

For the given function, find the value of x that corresponds to the given value of f(x).

11) $f(x) = 4x - 5$, $f(x) = 5$

12) $f(x) = -3x - 5$, $f(x) = 10.6$

13) $f(x) = -2x + 1$, $f(x) = 5.2$

14) $f(x) = -2x + 1$, $f(x) = -6.4$

Solve the problem.

15) David recently switched to a long distance phone company which charges a monthly fee of \$5.95 plus \$0.06 per minute. Find a linear function f(m) that expresses the monthly bill as a function of minutes used m.

16) David recently switched to a long distance phone company which charges a monthly fee of \$7.95 plus \$0.05 per minute. Find a linear function f(m) that expresses the monthly bill as a function of minutes used m.

17) A company has just purchased a new computer for \$7800. The company chooses to depreciate the computer using the straight–line method over 6 years. A linear function that expresses the book value of the computer as a function of its age x is $f(x) = -1300x + 7800$. What is the book value of the computer after 2 years?

Simplify the expression without using a calculator.

18) -6^3

19) -4^{-3}

20) $\frac{2^7}{2^5}$

21) $\frac{1}{4^{-3}}$

22) $\frac{1}{3^{-4}}$

Simplify the expression.

23) $y(y^5)$

24) x^2x^3

25) x^2y^{-4}

26) $(4p^5)(-3p^2)$

27) $(-3x^5y^{-6})(5x^{-1}y)$

28) $(12x^3y4)^{-1}(2x^2y)^4$

29) $(4x^{-6}y^4z^{-3})^{-2}$

30) $\frac{-54a^{13}b^{-4}}{9a^2b^{-11}}$

31) $\frac{3^{-6}x^{-5}y^{4}}{3^{-3}x^{-8}y^{8}}$

32) $\frac{6x^{-4}y^{-3}z^{4}}{2xy^{-3}z^{-4}}$

33) $\left(\frac{4x^{-2}y^{2}}{12x^{-4}y^{-1}}\right)^{3}$

Evaluate as specified.

34) For $f(x) = 32^{x}$, find $f\left(\frac{6}{5}\right)$.

35) For $g(x) = 3^{x}$, find $g(n + 2)$.

Write the number in standard decimal form.

36) 6.75×10^{7}

37) 5.45×10^{6}

38) 4.431×10^{-5}

39) 9.875×10^{-5}

Write the number in scientific notation.

40) 5502

41) 0.000033614

Simplify the expression. Assume that all variables are positive.

42) $x^{7/8}\, x^{1/8}$

43) $x^{-1/7}\, x^{-7/2}$

44) $(x^{1/7})^{-7}$

45) $(x^{-1/4})^{-1/3}$

46) $\dfrac{24x^{2/3}}{3x^{1/4}}$

47) $\dfrac{b^{2/3}c^{1/2}}{b^{-1/3}c^{-1/2}}$

48) $\dfrac{(-3x^{2/7})^5}{x^{-1/2}}$

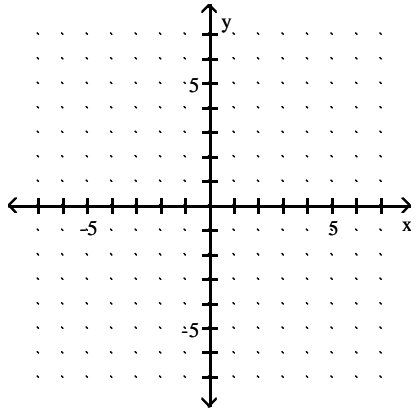
49) $\dfrac{x^{-1/2}y^{7/8}}{(x^2y^{-5})^{-1/2}}$

50) $\dfrac{(2744b^{-4}c^{15})^{1/3}}{(128b^{28}c^5)^{3/7}}$

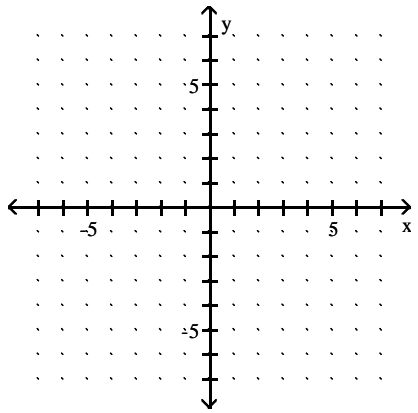
51) $\left(\dfrac{2^2x^{1/3}y^5}{x^{1/3}}\right)^{1/2}$

Sketch the graph of the given function.

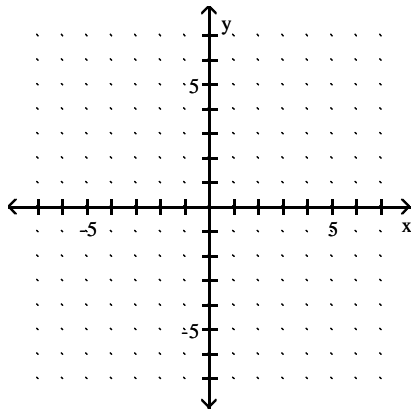
52) $y = 2^x$



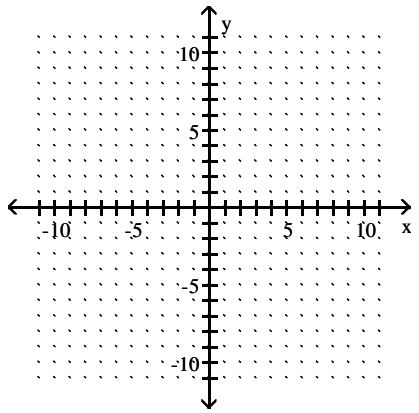
53) $f(x) = 4(3)^x$



54) $f(x) = 30(\frac{1}{5})^x$

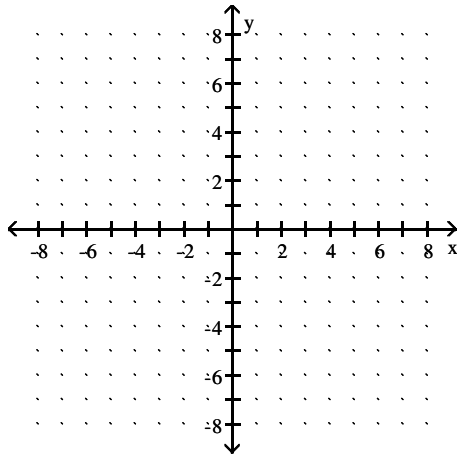


55) $f(x) = 12(\frac{2}{3})^x$

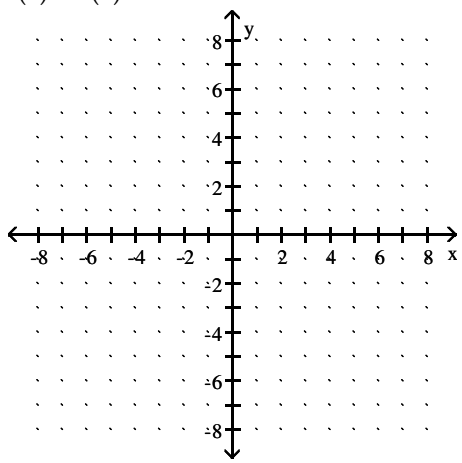


Graph the function by hand. Then use a graphing calculator to verify your graph. Find the domain and range of the function.

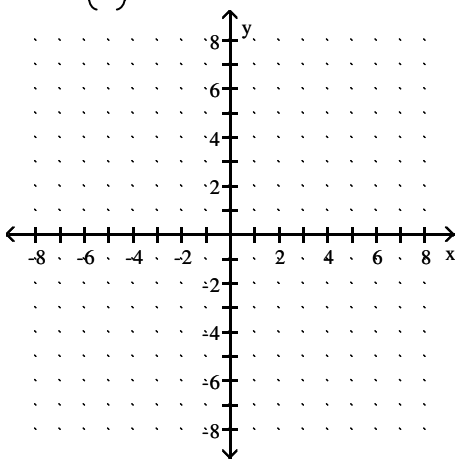
56) $f(x) = -6(5)^x$



57) $f(x) = 4(3)^x$

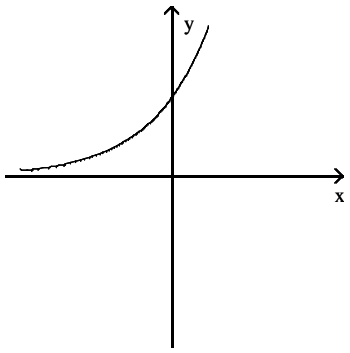


58) $f(x) = 8\left(\frac{1}{9}\right)^x$



A graph of a function of the form $y = ab^x$ is given. What can you conclude about the constants a and b?

59)



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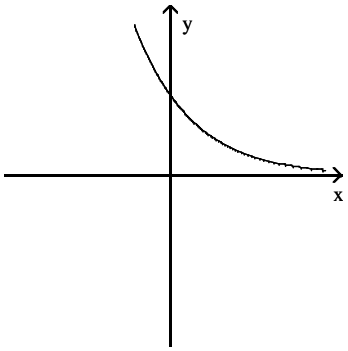

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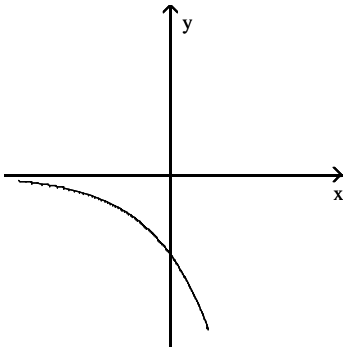


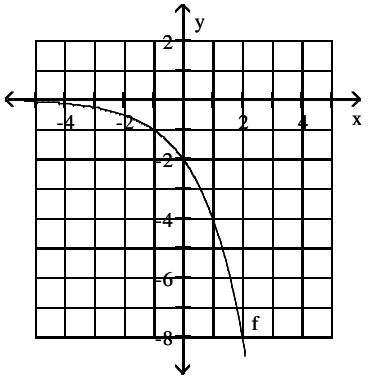
Input–output pairs of four exponential functions are listed in the table. Complete the table.

62)

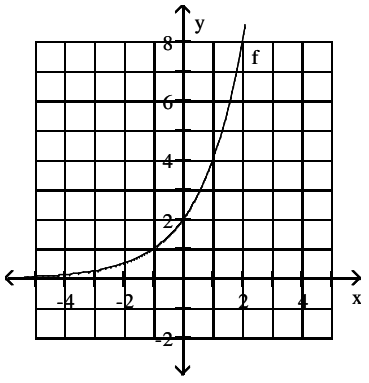
x	f(x)	g(x)	h(x)	k(x)
0	4	162	3	1200
1	8	54	9	600
2	16	18		
3	32			
4				

Use the graph to find the requested value.

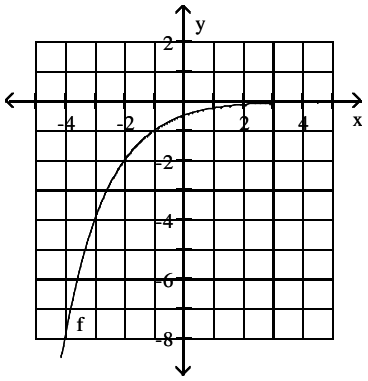
63) Find x where f(x) = –2.



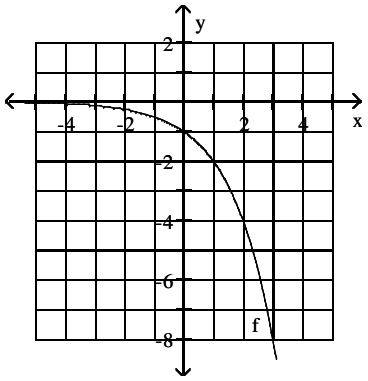
64) Find f(0).



65) Find f(–3).



66) Find x where f(x) = –4.



Find the x– and y–intercepts for the function.

67) $y = 4(\frac{6}{7})^x$

68) $y = -7(\frac{7}{6})^x$

69) $y = 3(\frac{5}{9})^x$

70) $y = -8(\frac{4}{3})^x$

Find all real–number solutions. Round your answer to the second decimal place, if necessary.

71) $b^2 = 64$

72) $b^4 = 16$

73) $2.7b^3 - 74.3 = 222.9$

74) $\frac{9}{4}b^5 + \frac{5}{8} = \frac{5}{6}$

75) $\frac{5}{8}b^3 + \frac{7}{5} = \frac{7}{4}$

76) $\frac{b^7}{b^3} = 256$

77) $\frac{b^7}{b^4} = \frac{75}{4}$

Find an approximate equation $y = ab^x$ of the exponential curve that contains the given pair of points. Round the values of a and/or b to two decimal places, if necessary.

78) (0, 5.2) and (3, 77.3)

79) (2, 7) and (5, 57)

80) (2, 4) and (5, 69)

81) (7, 14.3) and (12, 110.3)

82) (7, 14.3) and (12, 89.1)

83) (7, 16.7) and (12, 89.1)

Solve the system.

84) $y = 2(5)^x$, $y = 2(\frac{1}{6})^x$

85) $y = 4(8)^x$, $y = 4(\frac{1}{7})^x$

86) $y = 6(9)^x$, $y = 6(\frac{1}{5})^x$

Solve the problem.

87) Four bacteria are placed in a petri dish. The population will double every day. How many bacteria are in the dish seven days after the four bacteria are placed in the dish?

88) Three bacteria are placed in a petri dish. The population will double every day. How many bacteria are in the dish six days after the three bacteria are placed in the dish?

89) Austin invested $12,000 in an account at 10% compounded annually. Find the amount in Austin's account after a period of 8 years.

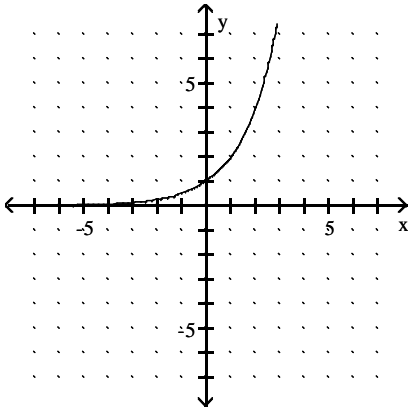
90) Suppose that 4434 units of a new product were sold in 2003. Each year after 2003, sales of the product were half the previous year's sales. Let g(t) be the sales of units of the product in the year that is t years since 2003. Find an equation of g.

91) A particular new car is worth $19,500. With each passing year, the value of the car will be 0.81 times its value the previous year. To the nearest dollar, what will the car be worth in 3 years?

92) The half–life of aspirin in a person's bloodstream is about 15 minutes. If a person's bloodstream contains 256 milligrams of aspirin, how much of that aspirin will remain after 60 minutes?

1) No
2) Yes
3) function
4) function
5) not a function
6) not a function
7) not a function
8) not a function
9) 10
10) 6
11) 2.5
12) –5.2
13) –2.1
14) 3.7
15) f(m) = 0.06m + 5.95
16) f(m) = 0.05m + 7.95
17) 5200.00
18) –216
19) $-\frac{1}{64}$
20) 4
21) 64
22) 81
23) y^6
24) x^5
25) $\frac{x^2}{y^4}$
26) $-12p^7$
27) $\frac{-15x^4}{y^5}$
28) $\frac{4}{3}x^5$
29) $\frac{x^{12}z^6}{16y^8}$
30) $-6a^{11}b^7$
31) $\frac{x^3}{27y^4}$
32) $\frac{3z^8}{x^5}$
33) $\frac{x^6y^9}{27}$
34) 64
35) $9(3^n)$
36) 67,500,000
37) 5,450,000

38) 0.00004431
39) 0.00009875
40) 5.502×10^{3}
41) 3.3614×10^{-5}
42) x
43) $\frac{1}{x^{51/14}}$
44) $\frac{1}{x}$
45) $x^{1/12}$
46) $8x^{5/12}$
47) bc
48) $-243x^{27/14}$
49) $\frac{x^{1/2}}{y^{13/8}}$
50) $\frac{7c^{20/7}}{4b^{40/3}}$
51) $2y^{5/2}$
52)



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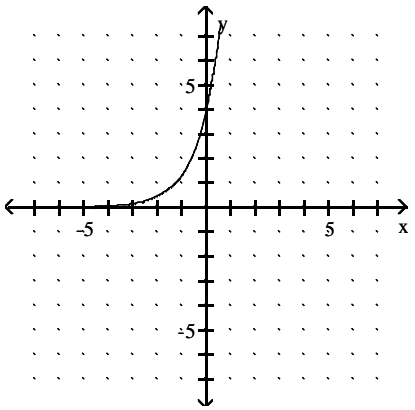

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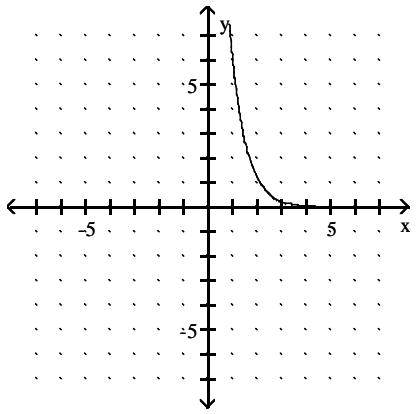

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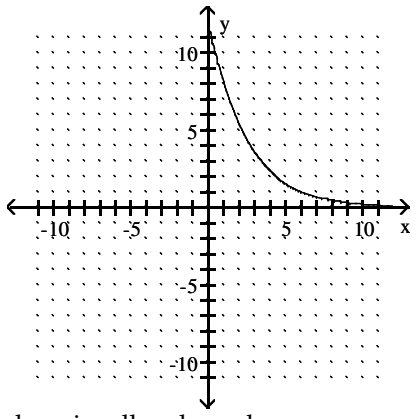
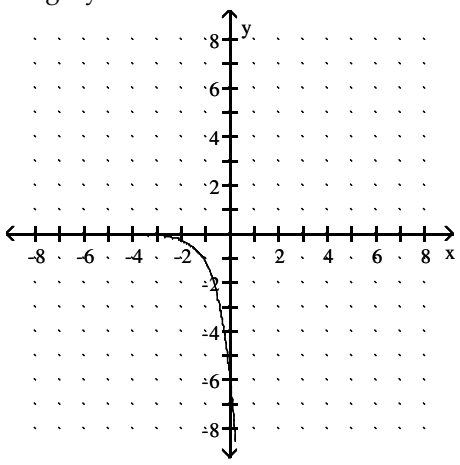
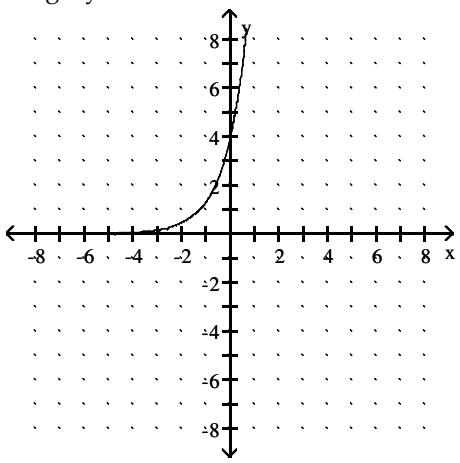


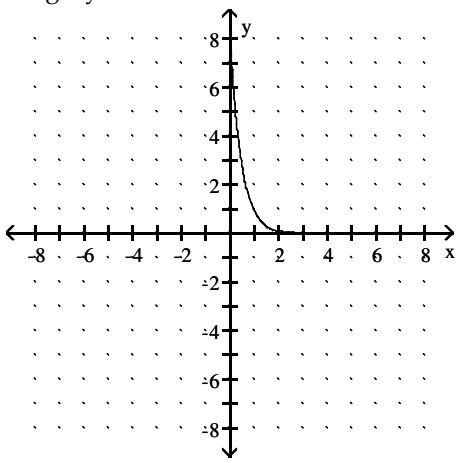
56) domain: all real numbers;
range: $y < 0$



57) domain: all real numbers;
range: $y > 0$



58) domain: all real numbers;
range: $y > 0$



59) $a > 0,\ b > 1$
60) $a > 0,\ 0 < b < 1$
61) $a < 0,\ b > 1$
62)

x	f(x)	g(x)	h(x)	k(x)
0	4	162	3	1200
1	8	54	9	600
2	16	18	27	300
3	32	6	81	150
4	64	2	243	75

63) 0
64) 2
65) –4
66) 2
67) no x–intercept; y–intercept is (0, 4)
68) no x–intercept; y–intercept is (0, –7)
69) no x–intercept; y–intercept is (0, 3)
70) no x–intercept; y–intercept is (0, –8)
71) ±8

72) ±2
73) 4.79
74) 0.62
75) 0.82
76) ±4
77) 2.66
78) $y = 5.2(2.46)^x$
79) $y = 1.73(2.01)^x$
80) $y = 0.60(2.58)^x$
81) $y = 0.82(1.50)^x$
82) $y = 1.10(1.44)^x$
83) $y = 1.60(1.40)^x$
84) (0, 2)
85) (0, 4)
86) (0, 6)
87) 512
88) 192
89) $25,723.07
90) $g(t) = 4434(0.5)^t$
91) $10,363
92) 16 mg