Quiz 2 Preparation 2.1, 2.2, 2.3, & 4.1 v01
No Book/No Notes/Yes Calculator 20 minutes
Summer 2012

Name_____

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

Solve.

1) The average value of a certain type of automobile was $15,900 in 1991 and depreciated to $8940 in 1995. Let y be the average value of the automobile in the year x, where $x = 0$ represents 1991. Write a linear equation that models the value of the automobile in terms of the year x. 1) _____

2) An investment is worth $2778 in 1992. By 1996 it has grown to $3390. Let y be the value of the investment in the year x, where $x = 0$ represents 1992. Write a linear equation that models the value of the investment in the year x. 2) _____

3) A faucet is used to add water to a large bottle that already contained some water. After it has been filling for 4 seconds, the gauge on the bottle indicates that it contains 21 ounces of water. After it has been filling for 11 seconds, the gauge indicates the bottle contains 49 ounces of water. Let y be the amount of water in the bottle x seconds after the faucet was turned on. Write a linear equation that models the amount of water in the bottle in terms of x. 3) _____

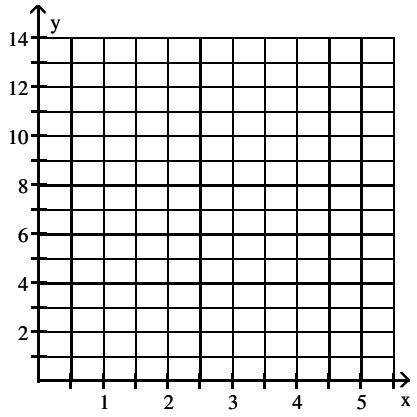
4) When making a telephone call using a calling card, a call lasting 4 minutes costs $1.30. A call lasting 11 minutes costs $2.70. Let y be the cost of making a call lasting x minutes using a calling card. Write a linear equation that models the cost of making a call lasting x minutes. 4) _____

5) In 1995, the average annual salary for elementary school teachers was $24,269. In 2000, the average annual salary for elementary school teachers was $28,148. Let y be the average annual salary in the year x, where x = 0 represents the year 1995.
a) Write a linear equation that models the average annual salary for elementary school teachers in terms of year x.
b) Use this equation to determine the average annual salary for elementary school teachers in 1999. 5) _____

Solve the problem.

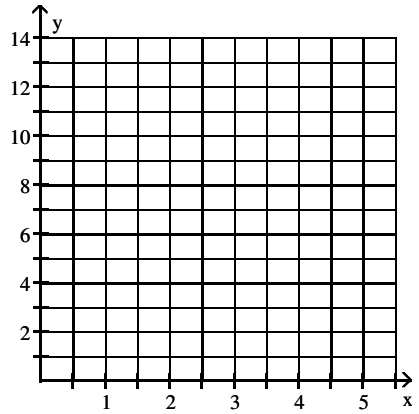
6) Draw a scattergram of the given data. Find the equation of the line containing the points (2.1, 8.1) and (4.6, 3.1). Graph the line on the scattergram. 6) _____

x	1.3	2.1	2.9	3.8	4.6
y	9.5	8.1	5.9	4.5	3.1



7) Draw a scattergram of the given data. Find the equation of the line containing the points (2.2, 8.1) and (4.6, 2.9). Graph the line on the scattergram. 7) _____

x	1.3	2.2	2.9	3.7	4.6
y	9.3	8.1	5.7	4.5	2.9



8) Given below are the winning times for the men's 100 meter Olympic freestyle for various years. 8) _____

Year	Winning Times in Olympic 100 Meter Freestyle (in seconds)
1960	55.2
1964	53.4
1968	52.2
1972	51.22
1976	49.99
1980	50.4
1984.	49.8
1988	48.63
1992	49.02
1996	48.74

(Source: The Universal Almanac)

Let W represent the winning time (in seconds) at t years since 1950. Using **Linear Regression** on your calculator, find an equation of a linear model to describe the data round values to the nearst hundredth.

Note: The answer to this exercise is: $y = -.17x + 55.55$

Evaluate the function at the given value of x.

9) $f(x) = 8x - 3$, $f(3)$ 9) _____

10) $f(x) = 3x + 1$, $f(\frac{2}{3})$ 10) _____

11) $f(x) = 2x - 3$, $f(a - 1)$ 11) _____

12) $f(x) = 7 - 8x^2$, $f(-5)$ 12) _____

13) $f(x) = \frac{x + 10}{6x - 14}$, $f(5)$ 13) _____

14) $f(x) = \frac{x - 10}{4x + 15}$, $f(-5)$ 14) _____

15) $f(x) = \frac{x - 2}{2x - 15}$, $f(8)$ 15) _____

16) $f(x) = \frac{x - 9}{3x + 13}$, $f(-5)$ 16) _____

17) $f(x) = 9 - 4x^2$, $f(-3)$ 17) _____

Find the x–intercept and y–intercept of the function.

18) $f(x) = 2x + 6$ 18) _____

Solve the problem.

19) 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. 19) _____

20) A company has just purchased a new computer for $5500. The company chooses to depreciate the computer using the straight–line method over 5 years. A linear function that expresses the book value of the computer as a function of its age x is $f(x) = -1100x + 5500$. What is the book value of the computer after 2 years? 20) _____

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

Simplify the expression without using a calculator.

21) $(-2)^0$ 21) _____

A) 1 B) 0 C) –1 D) 2

22) -7^0 22) _____

A) 7 B) 0 C) –1 D) 1

23) $\frac{4^{-9}}{4^{-3}}$ 23) _____

A) $\frac{1}{4096}$ B) $-\frac{1}{4096}$ C) –4096 D) 4096

24) $\frac{1}{5^{-3}}$ 24) _____

A) $\frac{1}{125}$ B) $-\frac{1}{125}$ C) – 125 D) 125

Simplify the expression.

25) $6x^{-3}y^8$ 25) _____

A) $\frac{y^8}{6x^3}$ B) $\frac{6x^3}{y^8}$ C) $\frac{6y^8}{x^3}$ D) $\frac{6}{x^3y^8}$

26) $\frac{x^2y^{-7}}{z^{-6}}$ 26) _____

A) $\frac{x^2z^7}{y^6}$ B) $\frac{x^2z^6}{y^7}$ C) $\frac{y^7}{x^2z^6}$ D) $\frac{z^6}{x^2y^7}$

27) $\frac{x^9y^{-3}}{z^{-9}}$ 27) _____

A) $\frac{x^9z^3}{y^9}$ B) $\frac{x^9z^9}{y^3}$ C) $\frac{z^9}{x^9y^3}$ D) $\frac{y^3}{x^9z^9}$

28) $\frac{-42a^{12}b^{-3}}{7a^6b^{-8}}$ 28) _____

A) $\frac{-6}{a^6b^5}$ B) $\frac{-6a^6}{b^5}$ C) $\frac{-6b^5}{a^6}$ D) $-6a^6b^5$

29) $\frac{8a^7b^{-4}}{4a^2b^{-11}}$ 29) _____

A) $\frac{2a^5}{b^7}$ B) $2a^5b^7$ C) $\frac{2}{a^5b^7}$ D) $\frac{2b^7}{a^5}$

30) $\frac{4^{-5}x^{-5}y^{4}}{4^{-2}x^{-8}y^{8}}$ 30) _____

A) $\frac{x^{3}}{64y^{4}}$ B) $\frac{3x^{3}}{y^{4}}$ C) $\frac{1}{64x^{8}y^{4}}$ D) $\frac{64}{x^{3}y^{4}}$

31) $\frac{2^{-9}x^{-4}y^{2}}{2^{-6}x^{-7}y^{4}}$ 31) _____

A) $\frac{1}{8x^{7}y^{2}}$ B) $\frac{8}{x^{3}y^{2}}$ C) $\frac{3x^{3}}{y^{2}}$ D) $\frac{x^{3}}{8y^{2}}$

32) $\frac{6x^{-5}y^{-2}z^{3}}{2xy^{-2}z^{-3}}$ 32) _____

A) $\frac{x^{6}}{3z^{6}}$ B) $\frac{3z^{6}}{x^{6}}$ C) $\frac{x^{8}}{3z^{6}}$ D) $\frac{3x^{6}}{z^{6}}$

33) $\frac{6x^{-5}y^{-3}z^{3}}{2xy^{-3}z^{-3}}$ 33) _____

A) $\frac{x^{6}}{3z^{6}}$ B) $\frac{x^{12}}{3z^{6}}$ C) $\frac{3x^{6}}{z^{6}}$ D) $\frac{3z^{6}}{x^{6}}$

34) $(3p^6)(5p^4)$ 34) _____

A) $-15p^{10}$ B) $15p^{10}$ C) $-15p^{24}$ D) $15p^{24}$

35) $(-2x^3y^{-4})(5x^{-1}y)$ 35) _____

A) $\frac{-10x^2}{y^3}$ B) $\frac{-10x^4}{y^5}$ C) $-10x^2y^5$ D) $\frac{3x^2}{y^3}$

36) $(9b)^0$ 36) _____

A) b B) 9 C) 0 D) 1

37) $(x^4)^{-9}$ 37) _____

A) $-x^{36}$ B) $-9x^4$ C) $-9x^{36}$ D) $\frac{1}{x^{36}}$

38) $(x^{-9})^{-4}$ 38) _____

A) $\frac{1}{x^{36}}$ B) $-4x^{36}$ C) $-x^{36}$ D) x^{36}

39) $(10x^4y^3)^{-1}(5x^4y)^3$ 39) _____

A) $\frac{25}{2}x^0$ B) $\frac{125}{2}x^8$ C) $\frac{25}{2}x^8$ D) $\frac{125}{2}x^0$

40) $(5x^{-2}y^8z^{-5})^{-3}$ 40) _____

A) $\frac{y^{11}}{-15x^5z^8}$ B) $\frac{x^6z^{15}}{-15y^{-24}}$ C) $\frac{x^6z^{15}}{125y^{24}}$ D) $\frac{y^{11}}{125x^5z^8}$

41) $\left(\frac{xy^6}{x^4y}\right)^{-2}$ 41) _____

A) $\frac{1}{x^{10}y^{14}}$ B) $\frac{x^6}{y^{10}}$ C) $\frac{1}{x^6y^{13}}$ D) $\frac{y^{10}}{x^6}$

42) $\left(\frac{8x^{-4}}{9y^{-4}}\right)^{-1}$ 42) _____

A) $\frac{8x^4}{9y^4}$ B) $\frac{9y^4}{8x^4}$ C) $\frac{8x^{41}}{9y^{41}}$ D) $\frac{9x^4}{8y^4}$

43) $\left(\frac{9x^{-4}z^{3}}{3xz^{-3}}\right)^{-2}$ 43) _____

A) $\frac{x^{10}z^{12}}{9}$ B) $\frac{x^{10}}{9z^{12}}$ C) $\frac{x^{6}}{9z^{12}}$ D) $\frac{3x^{10}}{z^{12}}$

44) $\frac{1}{b^{-1}} + \frac{1}{c^{-1}}$ 44) _____

A) $-(b + c)$ B) $\frac{1}{b + c}$ C) $b + c$ D) $\frac{1}{(b + c)^{-1}}$

45) $((b^{-1})^{-1})^{-1}$ 45) _____

A) b^{-3} B) $\frac{1}{b}$ C) b D) $\frac{1}{b^{3}}$

Simplify the expression. Assume that n is a counting number.

46) $b^{(6n - 4)}b^{(2n + 1)}$ 46) _____

A) $b^{(4n - 3)}$ B) $b^{(4n + 5)}$ C) $b^{(8n - 3)}$ D) $b^{(8n + 5)}$

47) $\frac{b^{(5n-3)}}{b^{(3n+1)}}$ 47) _____

A) $b^{(8n-4)}$ B) $b^{(2n+4)}$ C) $b^{(8n+4)}$ D) $b^{(2n-4)}$

Evaluate as specified.

48) For $f(x) = 5(2)^x$, find $f(3)$. 48) _____

A) 8 B) 1000 C) 30 D) 40

49) For $g(x) = 5^x$, find $g(n + 3)$. 49) _____

A) 125^n B) $125(5^n)$ C) $5(5^n)$ D) $125 + 5^n$

50) For $g(x) = 3^x$, find $g(n + 2)$. 50) _____

A) $9(3^n)$ B) $9 + 3^n$ C) 9^n D) $3(3^n)$

51) For $g(x) = 3^x$, find $g(n + 3)$. 51) _____

A) $3(3^n)$ B) 27^n C) $27 + 3^n$ D) $27(3^n)$

52) For $g(x) = 5^x$, find $g(n + 2)$. 52) _____

A) 25^n B) $25(5^n)$ C) $25 + 5^n$ D) $5(5^n)$

53) For $g(x) = 3^x$, find $g(2n)$. 53) _____

A) $9 + 3^n$ B) $9(3^n)$ C) 9^n D) $2(3^n)$

54) For $g(x) = 3^x$, find $g(3n)$. 54) _____

A) 27^n B) $27(3^n)$ C) $3(3^n)$ D) $27 + 3^n$

55) For $g(x) = 5^x$, find $g(2n)$. 55) _____

A) $25(5^n)$ B) 25^n C) $2(5^n)$ D) $25 + 5^n$

56) For $g(x) = 5^x$, find $g(3n)$. 56) _____

A) $125(5^n)$ B) 125^n C) $3(5^n)$ D) $125 + 5^n$

57) For $f(x) = 3(2)^x$, find f(–4). 57) _____

A) $\frac{3}{16}$ B) $\frac{1}{16}$ C) –1296 D) $\frac{1}{1296}$

58) For $f(x) = \left(\frac{1}{3}\right)^x$, find f(2). 58) _____

A) $\frac{1}{6}$ B) –9 C) $\frac{1}{9}$ D) $\frac{2}{3}$

59) For $f(x) = \left(\frac{1}{3}\right)^x$, find f(–4). 59) _____

A) $\frac{1}{81}$ B) 81 C) –12 D) $-\frac{1}{81}$

Write the number in standard decimal form.

60) 2.26×10^6 60) _____

A) 226,000 B) 135.6 C) 22,600,000 D) 2,260,000

61) 7.32×10^{-4} 61) _____

A) –732,000 B) 0.000732 C) 0.00732 D) 0.0000732

62) 2.803×10^{-5} 62) _____

A) 0.000002803 B) 0.0002803 C) 0.00002803 D) –280,300

63) 4×10^{4} 63) _____

A) 40,000 B) 0.00004 C) 0.0004 D) 400,000

Write the number in scientific notation.

64) 143,249 64) _____

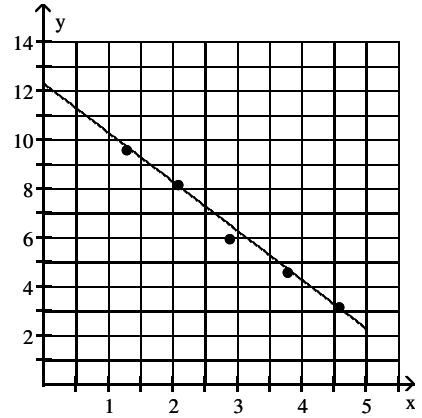
A) 1.43249×10^{1} B) 1.43249×10^{6} C) 1.43249×10^{-5} D) 1.43249×10^{5}

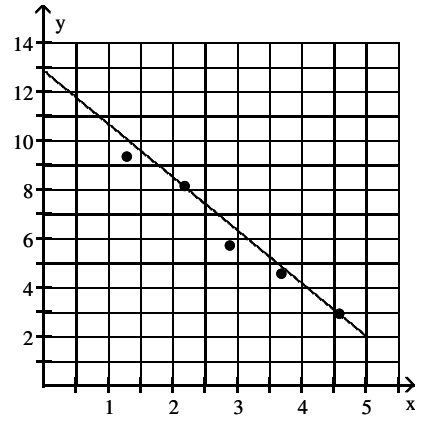
65) 6,700,000 65) _____

A) 6.7×10^{6} B) 6.7×10^{5} C) 6.7×10^{-6} D) 6.7×10^{-5}

66) 0.000271 66) _____

A) 2.71×10^{-3} B) 2.71×10^{4} C) 2.71×10^{-5} D) 2.71×10^{-4}

1) y = –1740x + 15,900
2) y = 153x + 2778
3) y = 4x + 5
4) y = 0.2x + 0.5
5) a) y = 775.8x + 24,269
   b) $27,372.20
6) 

   y = –2x + 12.3
7) 

   y = –2.1666667x + 12.87
8) W = –0.17t + 55.55; Answers may vary.
9) 21
10) 3
11) 2a – 5
12) –193
13) $\frac{15}{16}$
14) 3
15) 6
16) 7
17) –27
18) x–intercept: (–3, 0)
    y–intercept: (0, 6)

19) f(m) = 0.05m + 7.95
20) 3300.00
21) A
22) C
23) A
24) D
25) C
26) B
27) B
28) D
29) B
30) A
31) D
32) B
33) D
34) B
35) A
36) D
37) D
38) D
39) C
40) C
41) B
42) D
43) B
44) C
45) B
46) C
47) D
48) D
49) B
50) A
51) D
52) B
53) C
54) A
55) B
56) B
57) A
58) C
59) B
60) D
61) B
62) C
63) A
64) D
65) A
66) D