College Algebra Chapters 1 and 2.1, 2.2 Practice Test, Calculator Allowed

### Solve the equation algebraically. I.

- 1.
- $\frac{1}{3}(r+6) = \frac{1}{6}(r+8)$ -3.3q + 1.3 = -22.9 1.1q 2.

### II. Find the slope-intercept form of the line passing through these points.

(-6, -7) and (1, -1)3.

#### III. Solve the following problems.

Suppose the sales of a particular brand of appliance (by units) are modeled by the linear 4. function S(x) = 80x + 2700, where S(x) represents the number of sales in year x, with x = 0corresponding to 1982.

- Find the number of sales in 1994. a)
- What year were the sales 4220 units? b)
- What is the slope for this problem and interpret it in context? c)

5. Using a phone card to make a long distance call costs a flat fee of \$0.54 plus \$0.23 per minute starting with the first minute.

- Write the linear equation that represents the cost per call. a)
- b) Find the total cost of a phone call which lasts 21 minutes.
- How long was the call if the cost was \$3.99? c)

The total number of inmates in custody between 1990 and 1998 in state and federal 6. prisons is given approximately by y = 68.476x + 728.654 thousand prisoners, where x is the number of years after 1990. Assume the model remains accurate.

- What are the slope and its meaning for this problem? a)
- In what year will the number of inmates be 865.61 thousand. (to the nearest year) b)
- c) How many inmates were there in the year 1996?

7. Persons taking a 30-hour review course to prepare for a standardized exam average a score of 620 on that exam. Persons taking a 70-hour review course average a score of 763.

- Find a linear function (y = mx + b form), S(t), which fits this data, and which a) expresses score as a function of time.
- Use the function to predict an average score for persons taking a 51-hour review b) course. Round your answer to the tenths place.

#### IV. Use best-fit linear modeling to solve the following problems.

8. The paired data below consists of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters).

Temp	62	76	50	51	71	46	51	44	79
Growth	36	39	50	13	33	33	17	6	16

- Use linear regression to find a linear function that predicts a plant's growth as a a) function of temperature. (Round to four decimal places)
- Would this be a good model for the problem? Explain/support your answer. b)

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9. The ages and lengths of several animals of the same species are recorded in the following table.

Age (months)	Length (inches)			
12	9			
15	12			
17	20			
21	21			
26	24			
28	27			
32	35			
38	40			
41	40			

a) Use linear regression to model the data, round to 4 decimal places.

b) State the value of "r" to 4 decimal places.

c) Is the linear equation a good fit for the data set? Explain/support your answer.

d) Use linear regression to predict the length of a 29-month-old animal.

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# Answers:

- 1. r = -4
- 2. q = 11
- 3.  $y = \frac{6}{7}x \frac{13}{7}$
- 4. a)  $\dot{S}(12) = 3660$ 
  - b) 2001
  - c) m = 80, each year there is an increase of 80 units sold.
- 5. a) y = 0.23x + 0.54
  - b) A 21 minute call will cost \$5.37
  - c) A call costing \$3.99 lasted 15 minutes.
- 6. a) m = 68.476, each year there is an increase of 68,476 inmates
  - b) There will be 865.61 thousand inmates in 1992
  - c) In 1996 there was 1,139,510 inmates.
- 7. a) S(t) = 3.575x + 512.75
  - b) A person taking a 51-hour review should score 695.1 on the exam.
- 8. a) f(x) = 0.2111x + 14.5692
  - b) Not a good fit since the value of r = 0.1955 is not close to 1 at all
- 9. a) f(x) = 1.0869x 2.4419
  - b) r = 0.9805
  - c) Yes it is a good fit since the value of r is close to 1.
  - d) f(29) = 29.0782; an animal 29 months old should be 29.1 inches long.