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Circle the letter corresponding to your answer. Circle only one answer per question. There is no partial credit on this portion of the quiz.

1. T     F     The domain of  $f(x) = \sqrt{x^2 + 1}$  is  $x \neq -1$ .  
This is **False** since we need  $x^2 + 1 \geq 0$  which is always true. Therefore, the domain is all real numbers.
2. T     F     The equation of the line with slope 2 and  $y$ -intercept 3 is  $y = 2x + 3$ .  
This is **True**.
3. The equation of the line through  $(-2, -7)$  that is perpendicular to  $3x + 5y = 11$  is
  - A.  $y + 7 = \frac{5}{3}(x + 2)$
  - B.  $y - 7 = -\frac{3}{5}(x - 2)$
  - C.  $y - 7 = \frac{5}{3}(x - 2)$
  - D.  $y + 7 = -\frac{3}{5}(x + 2)$
  - E. None of the above

Let's find the slope of  $3x + 5y = 11$ :

$$5y = -3x + 11$$

$$y = -\frac{3}{5}x + \frac{11}{5}$$

so the slope is  $-\frac{3}{5}$ . The slope of the line perpendicular to that will have the a slope which is the negative reciprocal, so the equation is

$$y - (-7) = \frac{5}{3}(x - (-2))$$

$$y + 7 = \frac{5}{3}(x + 2)$$

So the answer is A.

For the next problem, show all work to receive full credit. No Work = No Credit.

4. The number of men in the work force (in millions) for selected decades from 1890 to 1990 can be approximated by the linear model determined by the line connecting  $(1890, 18.1)$  and  $(1990, 68.5)$ .

(a) Find the linear model for these data.

$$m = \frac{68.5 - 18.1}{1990 - 1890} = \frac{50.4}{100} = .504$$

So the equation of the line is

$$y - 18.1 = .504(x - 1890)$$

(b) When were 58.42 million men employed?

$$58.42 - 18.1 = .504(x - 1890)$$

$$40.32 = .504(x - 1890)$$

$$80 = x - 1890$$

$$1970 = x$$

In 1970, there were 58.42 million men employed.