Math 103 Final Exam Review, Fall 2013

1. Consider a jar filled with poker chips that have letters on them. There are seven green chips that are labeled A, B, C, D, E, F, and G. There are four red chips that are labeled A, B, C, and D. There are two blue chips that are labeled A, and B.

a) You removed two chips from the jar. You do not replace the first chip before removing the second chip. What is the probability that both chips are red?

b) You replace the chips and draw a single chip. What is the probability that the chip is a green chip or a chip with the letter “B” on it?

2. Solve for *x*: 4 – 2(2x + 5) = 9x – 5 – 2x

3. Solve for *x*: $6x^{2} -5x=1$

4. Consider the following numbers: 2, 4, 8, 3, 5, 8, 12

a) Find the mean. b) Find the mode. c) Find the median.

d) (2 pts) Find the standard deviation.

5. Given the line $y = -4x + 1$

a) Find the slope of the line.

b) Find the y-intercept of the line.

c) Find the x-intercept of the line.

d) Graph the line.

6. The chart below shows the numbers of military personnel who own cats and dogs.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Army | Navy | USMC | Air Force |
| Cats | 15 | 18 | 12 | 13 |
| Dogs | 17 | 20 | 15 | 13 |

If one military member with a pet is chosen at random, what is the probability

a) that the pet owned by a military member is a dog?

b) that the military member is in the Navy or owns a dog?

c) that the military member owns a cat and is in the Marine Corps?

d) that the member is in the Air Force given that the person owns a cat?

7. The Wet Bulb Globe Temperature, *W*, sets the flag conditions for PT on military bases, and is given by the following formula:

$$W = \frac{7}{10}T\_{w}+\frac{1}{5}T\_{g}+\frac{1}{10}T\_{d}$$

where *Tw* = the natural web-bulb temperature,

 *Tg* = the globe thermometer temperature, and

 *Td* = the dry bulb temperature

If *W*=95, *Tg*=115, and *Td*=90, what is *Tw*?

8. You are a DoD civilian. You buy a new computer on Amazon.com for $634 plus 5.5% tax. However, the government shuts down and you are forced to sell the computer on Craigslist for $500. You agree to meet the buyer on the other side of a toll bridge, which costs you $3.00. How much money did you lose on the purchase?

9. Because the government is still shut down, you decide to try to pay your bills by playing poker. If you are dealt 5 cards from a shuffled deck of 52 cards, find the probability that all five cards are face cards or aces (Jacks, Queens, Kings, or Aces).

10. You lose miserably at poker and you are desperate. You borrow $3500 from a loan shark, who tells you that in three months you will owe him $4100. What simple *yearly interest rate* will you pay?

11. You were doing well in math class until the last test (because you were worried about the government shutdown). You need to average 80 to get a “B” in the course, and there are four tests worth the same percentage. Your grades so far on the tests have been 92, 88, and 70. What score do you need to get on the fourth and last test so that you get a “B”?

12. Given the function $f \left(x\right)= x^{2}+5x+6$

a) Find the vertex (both *x* and *y* values)

b) Find the x-intercepts.

c) Find the y-intercept.

d) Graph the function.

13. Stupidity among congressmen and congresswomen can be modeled by the function

$$S\left(x\right)=12+e^{0.0188x}$$

where *x* is the number of years after 1776, and S(*x*) is on a scale from 1 to 100. According to this model, how stupid are members of congress in 2013?

14. You go to the Green Bean to buy a coffee and two muffins. Because of the government shutdown, your credit card got cancelled, and you didn’t have enough cash or POGs. You paid all you had ($6.00), and you still owe them $3.10. If one coffee and one muffin cost $6.30, how much does a cup of coffee cost? How much does a muffin cost?

Answers:

(1) a) 1/13 b) 11/13 (2) x= –1/11 (3) x= –1/6, x=1 (4) a) 6 b) 8 c) 5 d) 3.51

(5) a) m=–4 b) b=1 c) x=1/4 d) graph (6) a) 65/123 b) 83/123 c) 12/123 d) 13/58

(7) *Tw* = 87.1 (8) $165.87 (9) 0.00168 (10) 68.6% (11) 70

(12) a) (2.5, –0.25) b) x=–3, x=–2 c) y=6 d) graph

(13) 98.1 (14) muffin=$2.80, coffee=$3.50