

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 7 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	3	
2	3	
3	6	
4	3	
5	15	
6	7	
7	6	
8	16	
9	16	
10	4	
11	16	
12	5	
Total	100	

Name _____

CIRCLE FINAL ANSWERS

1) (3 points) At the magical restaurant Chipotle, you can select one of 5 different types of entrees, one of 5 different type of food item in that entrée, and one of 4 different types of salsa. What is the total number of meals possible?

2) (3 points) Twelve people are in a room, three of which will be asked to serve on a committee. How many ways can these committees be formed?

3) (3 points each) A kennel has 24 cats available for adoption: 10 Siamese, 8 Russian Blue, and 6 Persian. Five cats will randomly selected to make sure they are lovable. (Sorry, I'm a dog person.) What is the probability (in fractional form) that...

a) All cats selected are Siamese? b) Exactly 3 of them are Russian Blue?

4) (3 points) For problem 3, why could you **not** use a binomial probability to solve the question?

- 5) (4 points *a – c*; 3 points *d*) Suppose that it was previously found that 65% of Americans like to drink coffee when they wake up. Suppose 20 Americans were surveyed. Writing answers as percents rounded to four decimal places (e.g. 1.2345%), what is the probability that...
- a) All 20 drink coffee in the morning? b) Exactly 19 of them?

- c) At most 18 of them? d) Of the 20 Americans, how many would you expect to drink coffee in the morning?

- 6) Silly Billy is baking...again. He made 12 cookies, 7 of which fell on the floor. His 3 friends walk by and each take a cookie. Let x be the number of cookies that fell on the ground.
- a) (4 points) Fill in the probability distribution table for this problem. Write answers as percents rounded to 1 decimal place. Make sure your percents add up to 100%:

x	0	1	2	3
$P(x)$				

- b) (3 points) Find the expected number of cookies taken that happened to have fallen on the ground:

- 7) (3 points each) For the function $f(x) = 2x^2 - 4x + 1$, find and simplify...

- a) $f(7)$ b) $f(x+h)$

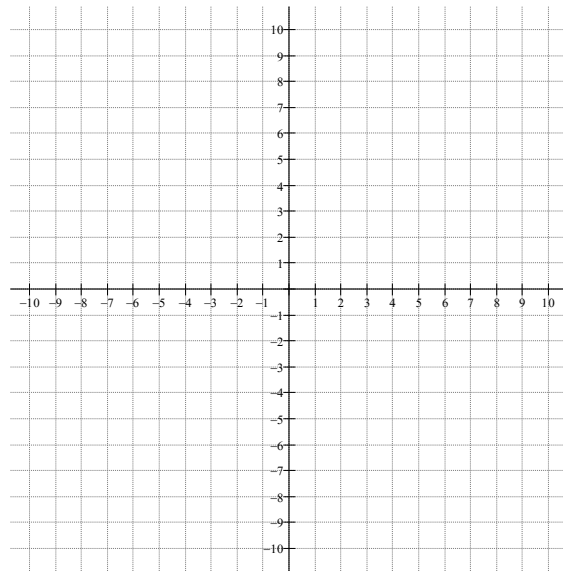
8) (4 points each) For the quadratic function $f(x) = x^2 - 2x - 8$, find...

a) The vertex:

b) The x -intercepts:

c) The y -intercept:

d) Sketch the graph using the above:



9) (4 points each) For the rational function $f(x) = \frac{3x + 3}{x^2 - 4x + 4}$, find...

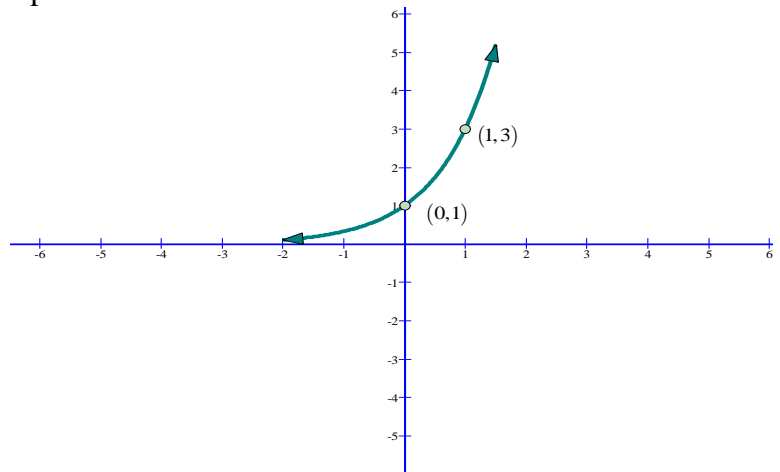
a) The domain:

b) Any intercepts (label your answers):

c) Any Vertical Asymptotes or Holes:

d) Any Horizontal Asymptotes:

- 10) (4 points) Given the graph of $y = 3^x$ below, write the steps necessary to sketch the graph of $f(x) = 3^{x+3} - 5$ using transformations and then sketch the graph of the function. Be sure to label the transformed points and asymptote:



- 11) (4 points each) Find the exact value of the variable. Do not use decimals:

a) $3^{2x-7} = 243$

b) $5e^{3x+6} = 25$

c) $\ln(4x+7) = \ln(3x+12)$

d) $\log_2(x-3) - \log_2(x+1) = 3$

- 12) (5 points) The half-life of a Big Mack is 6.8 years. Determine how much of a 12 oz sample is left after 10 years. Use the formula $y = y_0 e^{kt}$ by first solving for k . Write k as a decimal rounded to 4 decimal places:

Extra Credit (4 points):

Explain the four reasons why the following situation is that of a binomial probability:



It was found that the probability that an adult has seen the show “Bob’s Burgers” was 28.5%. Asking 13 adults at random, what is the probability that exactly 6 of them saw the show?

1. _____
2. _____
3. _____
4. _____

Extra Credit (2 points each)

a) What property do permutations and combinations share?

b) How do permutations and combinations differ?

CHAPTER 7 FORMULAS

Addition Rule for Sets: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

Addition Rule for Probability: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Odds for an Event: $\frac{P(E)}{P(\bar{E})}$ reduced Odds against an Event: $\frac{P(\bar{E})}{P(E)}$ reduced

Odds for event E a to b imply $P(E) = \frac{a}{a+b}$

Odds against event E a to b imply $P(E) = \frac{b}{a+b}$

Complement Rule: $P(E) = 1 - P(E')$

Conditional Probability: $P(E|F) = \frac{P(E \cap F)}{P(F)}$

Product Formula: $P(E \cap F) = P(F) \times P(E|F)$

Binomial Probability: $C(n, r) = p^r \cdot (1-p)^{n-r}$