

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 9 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.
- ❖ Draw a pumpkin on this page for something extra.
- ❖ 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	3	
4	3	
5	3	
6	4	
7	12	
8	6	
9	3	
10	3	
11	6	
12	3	
13	8	
14	4	
15	4	
16	4	
17	12	
18	6	
19	12	
20	2	
Total	100	

Name \_\_\_\_\_

CIRCLE FINAL ANSWERS

- 1) (3 points) Frank invests in the Darko Bank that offers a 3.25% simple interest rate. He invests \$600 at this rate for 8 years. How much is in the account after that time?
  
  
  
  
  
  
  
  
  
  
- 2) (3 points) Find the simple interest rate required for an investment of \$1,800 to grow to \$2,500 in 4 years. Write answer as a percent rounded to two decimal places.
  
  
  
  
  
  
  
  
  
  
- 3) (3 points) After accidentally knocking over an unmanned armored truck, Jesse found \$5,500 on the side of the road. He decided to put the money into a savings account that offered a 2.35% annual interest rate compounded monthly for 4 years. How much money will be in the account after that time and how much interest did he earn?
  
  
  
  
  
  
  
  
  
  
- 4) (6 points) How much should be invested now so that in 12 years there will be \$7,000 in an account that offers a 5.35% annual interest rate compounded quarterly?
  
  
  
  
  
  
  
  
  
  
- 5) (3 points) Which is a better way to invest? Option A: 6.3% compounded semi-annually or Option B: 6.25% compounded monthly? Write answer as a percent rounded to two decimal places.

- 6) (4 points) Kondor takes out a loan of \$100,000 for a condo. Her loan has a 4.12% annual interest rate compounded monthly for 30 years. Chart the first two months of the loan given the monthly mortgage payment is \$532.80. **Be sure to show the numbers that are being multiplied and subtracted. Round to two decimal places as you work:**

END OF MONTH	INTEREST	PRINCIPAL	BALANCE
1			
2			

- 7) Balthier is 30 years old and is working as a local sky pirate. He is able to deposit \$525 a month into a Pirate Bank 401-k which offers a 7.25% annual interest rate. He does this for 30 years. After that time, he will retire. He wishes, over the next 25 years, to take out equal withdraws until the account is emptied. Assume the interest rate is the same after retirement.
- a) (6 points) What are the equal withdraws he is able to take out?      b) (2 points) How much did he deposit before retirement?

c) (2 points) How much did he withdraw after retirement?

d) (2 points) How much interest did he earn overall?

- 8) (3 points each) Schmidt works out that he would need \$4,000 a month during his retired years. He is currently 25 years old and plans to work until his is 65. He assumes that he would need to make withdraws for 30 years past his retirement. Assuming he finds an account that will offer him a 6.25% annual interest rate compounded monthly...
- a) How much should he have in his account at retirement?      b) How much should he deposit monthly during his working years to ensure he meets his goal?

For numbers 9 – 11, use the following:

$$U = \{a, b, c, d, e, f, g, h, i\}, A = \{a, b, c\} B = \{x \mid x \text{ is a vowel}\}$$

9) (1 point each) Use the symbol  $\in$  or  $\notin$  below:

a)  $b$  \_\_\_\_\_  $A$

b)  $d$  \_\_\_\_\_  $A'$

c)  $u$  \_\_\_\_\_  $B$

10) (1 point each) Use the symbol  $\subseteq$  or  $\not\subseteq$  below:

a)  $\{a, e\}$  \_\_\_\_\_  $B$

b)  $\{j, k\}$  \_\_\_\_\_  $B'$

c)  $\emptyset$  \_\_\_\_\_  $A$

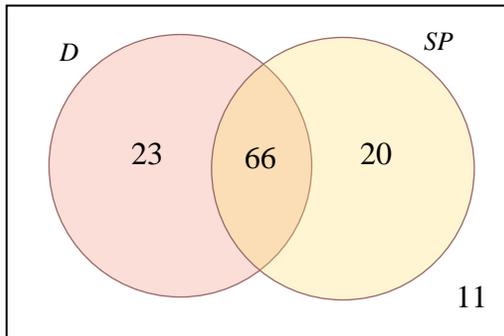
11) (2 points each) List the elements of the following sets:

a)  $A \cap B$ :

b)  $A' \cup B$ :

c) The subsets of set  $B$ :

12) (3 points) 120 adults who watch good TV were surveyed. The results are given in the Venn diagram below where  $B$  = Adults who watch *Bob's Burgers* and  $SP$  = Adults who watch *South Park*. Interpret, using the language of the problem, what each number in the Venn diagram means for this example:

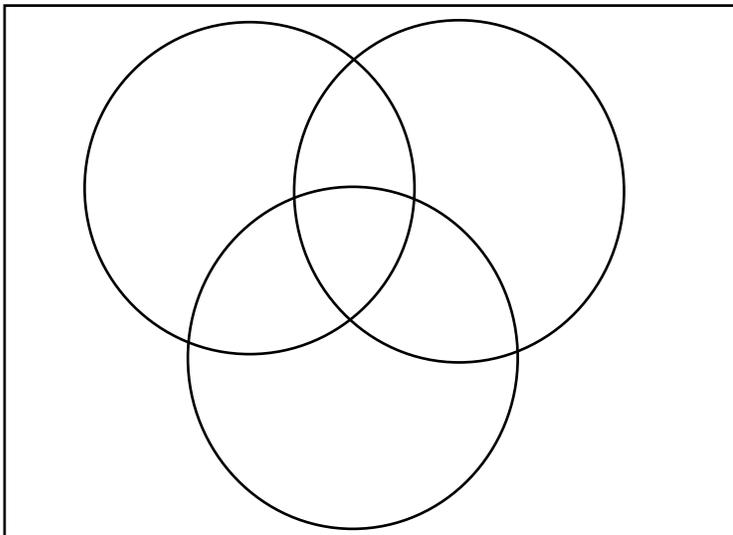


13) 100 people were surveyed on what addition(s) they like on their burgers. The results are below:

- 46 people like Bacon
- 40 like Lettuce
- 30 like Tomato
- 16 like Bacon and Lettuce
- 15 like Bacon and Tomato
- 8 like Lettuce and Tomato
- 6 like all three

Given this information, find **BY SHOWING THE NUMBERS YOU ARE ADDING TO GET YOUR ANSWER:...**

a) (3 points) The corresponding Venn Diagram.  
Be sure to label everything



b) (1 point) How many people like either Lettuce or Tomato but not Bacon?

c) (1 point) How many people only like Bacon?

d) (1 point) How many people do not like Lettuce nor Tomato?

14) (2 points each) Find the sample space associated with the following experiments:

a) Flip a coin 2 times:

b) Flip a coin 3 times:

15) (2 points each) After flipping a coin 3 times, find the probability of...

a) Getting exactly 1 head:

b) Getting at least 2 heads:

16) (2 points each) Dario has 12 PS3 games, 14 PS4 games, and 6 PSVita games. Picking a game at random, what are the **odds** that the game is....

a) A PS4 game?

b) Not a PSVita game?

17) (3 points each) In a room of 30 people, 17 saw the movie *Up*, 14 people saw the movie *Finding Nemo (FN)*, and 6 people saw both. Picking a person at random, what is the probability that they:

a) Saw *Up* and *FN*?

b) Saw *Up* or *FN*?

c) Saw *Up* given they saw *FN*?

d) Saw *FN* given they didn't see *Up*?

18) (3 points each) Consider picking a card from a standard deck of cards.

a) What is the probability of picking a Face Card and a Heart?

b) What is the probability of picking a Face Card and a Seven?

19) (3 points each) Three cards are picked from a standard deck of cards. Writing answers as a fraction, what is the probability that...

a) All three cards are Face Cards (if the cards are not replaced once picked):

b) All three cards are Face Cards (if the cards are replaced once picked):

c) The third card is a Heart given the previous cards were not replaced and were Diamonds:

d) The third card is a Heart given the previous cards were replaced and were Diamonds:

20) (1 points each) Short answer. When writing the answer to a question that give the following directions, how can you write your answer?

a) "What is the probability that..."

b) "What are the odds that..."

# CHAPTER 5 FORMULAS

Simple Interest:  $I = Prt$

Amount of Simple Interest:  $A = P + Prt = P(1 + rt)$

Compound Interest:  $A = P(1 + i)^n$

Effective Rate of Interest:  $APY = \left(1 + \frac{r}{m}\right)^m - 1$

Present Value:  $P = A(1 + i)^{-n}$

Future Value:  $FV = \frac{PMT \left( (1 + i)^n - 1 \right)}{(i)}$

Sinking Fund:  $PMT = \frac{FV(i)}{\left( (1 + i)^n - 1 \right)}$

Present Value of an Annuity:  $PV = \frac{PMT \left( 1 - (1 + i)^{-n} \right)}{(i)}$

Amortization:  $PMT = \frac{PV(i)}{\left( 1 - (1 + i)^{-n} \right)}$

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