

NAME : _____

Exam 3, Version A, Math 105

18 April 2013

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INSTRUCTIONS:

- This is a closed book, closed notes exam.
- You are not to give or receive help from any outside source during the exam.
- Calculators are permitted, but only for calculations, NOT FOR STORING FORMULAE OR OTHER INFORMATION.
- You have **50 minutes**.
- The exam is MULTIPLE CHOICE. Please use the scantron sheet which has been provided. PLEASE MARK THE VERSION OF YOUR EXAM ON THE FRONT!!!

Useful formulae:

Simple interest: $F = P(1 + r \cdot t)$ Compound interest: $F = P \left(1 + \frac{r}{n}\right)^{nt}$ or $F = P(1 + p)^T$

1. Suppose that in 10 years a savings bond will mature to a future value of 20,000.00. The APR is 8% annual simple interest. How much does the savings bond cost now?

- A. \$9010.47 **B.** \$11111.11 C. \$18,518.52 D. \$36,000.00 E. None of these

$$20,000 = P(1 + .08(10)) = P(1.8) \text{ so } P = \frac{20000}{1.8}$$

2. Ulysses McGill's credit card company has an 36% APR. The company charges interest *every month*. What is the *periodic interest rate* p , expressed as a decimal?

- A. .36 **B.** .03 C. .18 D. 36 E. none of these

$$p = \frac{.36}{12} = .03$$

3. Dr. Venkman wants to estimate the number of turtles living in Lake Gozer. He captures 10 turtles on his first visit to the lake, and marks their backs with paint. A week later he returns and captures 15 turtles. Five of these turtles have paint on their backs (i.e. they were recaptured). How many turtles does Dr. Venkman estimate are in the lake?

- A. 3.33 B. 45 C. 25 **D.** 30 E. None of these

$$\frac{10}{N} = \frac{5}{15} \text{ so } N = 30.$$

4. There are 208 million eligible voters in the U.S. If 115 million people voted in a recent election, what percentage of the eligible people voted? (Round to the nearest percent.)

- A. 50% **B.** 55% C. 58% D. 60% E. none of these

5. Sally opens a savings account on June 1, 2013, and deposits \$1500.00. The bank compounds monthly at 12% APR. Due to an emergency, she has to withdraw all the money in the account, on July 3, 2013. How much money does she withdraw?

- A. \$1500.00 **B.** \$1515.00 C. \$1650 D. \$1680 E. None of these

$$1 \text{ month: } F = P \left(1 + \frac{.12}{12} \right)^1 = 1500 (1.01)$$

6. If you invest \$1000.00 in a savings account that offers an APR of 9% compounded quarterly, how much will you have after 15 years?

- A.** \$3800.14 B. \$3838.04 C. \$54,546,84416.32 D. \$1396.21
E. None of these

$$F = 1000 \left(1 + \frac{.09}{4} \right)^{60}$$

The results of a challenging mathematics exam are shown in the table below.

| | | | | | | | | |
|------------|----|----|----|----|----|----|----|----|
| Scores: | 5 | 10 | 20 | 40 | 60 | 70 | 80 | 90 |
| Frequency: | 10 | 2 | 3 | 3 | 11 | 16 | 10 | 5 |

7. Find the first quartile, Q_1 .

- A. 20 **B.** 30 C. 40 D. 50 E. None of these

8. Find the mean (average).

- A. 60 B. 70 **C.** 54.67 D. 50 E. All are acceptable

A data set is shown in the table below.

| Data set | subtract 1.6 | # |
|----------|-----------------|-------|
| -4 | -5.6 | 31.36 |
| -2 | -3.6 | 12.96 |
| 2 | 0.4 | 0.16 |
| 4 | 2.4 | 5.76 |
| 8 | 6.4 | 40.96 |

$$\text{Mean} = \frac{8}{5} = 1.6$$

$$\text{avg: } 18.24$$

$$\text{st. dev} = \sqrt{18.24}$$

9. Find the interquartile spread of the data set.

- A. -2 B. 2 **C. 6** D. 4 E. None of these

$$4 - (-2) = 6$$

10. Find the standard deviation of the data set. (Round to two decimal places.)

- A. 1.6 B. $\sqrt{1.6}$ C. 18.24 **D. 4.27** E. None of these

11. A bank offers a simple interest loan at an APR of 6%. How much do you need to invest now so that you will have \$1000.00 after 5 years?

- A. \$800.00 **B. \$769.23** C. \$1300.00 D. \$943.40 E. None of these

$$1000 = P(1 + .06 \times 5)$$

$$= P(1.3)$$

12. The same bank offers another loan with an APR of 6% compounded monthly. How much do you need to invest now so that you will have \$1000.00 after 5 years?

- A. \$741.37** B. \$763.23 C. \$975.37 D. \$1348.85 E. None of these.

$$1000 = P \left(1 + \frac{.06}{12} \right)^{60}$$