

Math 110
Midterm Exam
Summer 2007

Show all work in a neat and organized fashion. Clearly indicate your answers.
100 points possible.

No calculators on this page.

1. Perform the indicated operation.

(a) (1 pt.) $-(-4)(5)$

(b) (1 pt.) -5^2

(c) (1 pt.) $\frac{5}{0}$

(d) (1 pt.) $-\frac{12}{3}$

(e) (1 pt.) $\frac{8}{5} + \frac{1}{3}$

(f) (2 pts.) $2\frac{1}{5} \div 1\frac{1}{7}$

(g) (2 pts.) $5\frac{1}{4} - 2\frac{1}{3}$

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The following formulas may or may not be useful.

Sales tax amount = tax rate \times item's cost

Discount amount = discount rate \times original price

Percent increase = $\frac{\text{amount of increase}}{\text{original amount}}$ ($\times 100\%$ to express as a percent)

Percent decrease = $\frac{\text{amount of decrease}}{\text{original amount}}$ ($\times 100\%$ to express as a percent)

$$A = P(1 + r)^t$$

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

$$P = \frac{A}{\left(1 + \frac{r}{n}\right)^{nt}}$$

$$Y = \left(1 + \frac{r}{n}\right)^n - 1$$

$$PMT = P \frac{\frac{r}{n}}{1 - \left(1 + \frac{r}{n}\right)^{-nt}} = P \frac{i}{1 - (1 + i)^{-m}}, \quad i = \frac{r}{n}, \quad m = nt$$

2. (20 pts.) Submit the take home Excel problem by Tuesday!
3. (2 pts.) The given statement is false. Prove it is false by showing a counterexample.

If the difference between two numbers is even, then both numbers are even.

4. (3 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to find the next few numbers.

3, 4, 7, 12, 19, 28, _____, _____, _____, _____, ...

5. (2 pts.) Graph the inequality $-4 < x \leq 3$ on a number line.
6. (2 pts.) What is 18% of 900?
7. (2 pts.) 214.5 is 26% of what?
8. (2 pts.) What percent of 82,300 is 246.9?

9. (3 pts.) Suppose that the local sales tax rate is 7% and you purchase a car for \$26,800.

(a) How much tax is paid?

(b) What is the car's total cost?

10. (2 pts.) Suppose a person's salary in 2006 was \$43,000 and in 2007 was \$95,000. Find the percent increase in salary from 2006 to 2007.

11. (3 pts.) You deposit \$1500 in a savings account that has a rate of 8.5%. The interest is compounded monthly.

(a) How much money will you have after 5 years?

(b) Find the interest earned after 5 years.

12. (3 pts.) Determine the effective annual yield, to the nearest hundredth of a percent, for each investment. Then select the better investment.

(a) 9% compounded monthly

(b) 9.1% compounded semiannually

13. (3 pts.) How much money should be deposited today in an account that earns 8% compounded annually so that it will accumulate to \$750,000 in 40 years?

14. (3 pts.) At the time of her grandson's birth, a grandmother deposits \$5000 in an account that pays 9% compounded monthly. What will be the value of the account at the child's 30th birthday, assuming that no other deposits or withdrawals are made during this period?