MTH 162
Quiz 2
Spring 2017

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

A graphing calculator is allowed (e.g., TI-84). No calculator with a Computer Algebra System (CAS) is allowed (e.g., TI-89, TI-Nspire).

1. (6 pts.) Find the derivative.

(a) $y = 20x^6 - 8x + 10$

(b) $y = x^{-6} + x^{-4}$

2. (4 pts.) A family wants to save \$52,000 in 3 years for a down payment on a house. If they make quarterly deposits in an account paying 8%, compounded quarterly, what is the size of the payments that are required to meet their goal?

3. (5 pts.) Develop the beginning of an amortization schedule for the loan described.

$45,000 for 1 year at 12%, compounded quarterly

Do only the rows for the first two payments.

Period	*Payment*	*Interest*	*Balance reduction*	*Unpaid balance*
				45,000.00
1				
2				

4. (5 pts.) Let $f(x) = 3x^2 + 4x - 12$. In this problem, you will find $f'(x)$ by using the definition of derivative. The five steps are outlined for you. For parts (a) through (e), simplify the given expression.

(a) $f(x+h) =$

(b) $f(x) =$

(c) $f(x+h) - f(x) =$

(d) $\dfrac{f(x+h) - f(x)}{h} =$

(e) $f'(x) = \lim_{h \to 0} \dfrac{f(x+h) - f(x)}{h} =$

TVM App:

N = number of periods = (number of periods per year) · (number of years)

$$\text{I\%} = \text{periodic interest rate} = \frac{\text{nominal annual interest rate}}{\text{number of periods per year}}$$

PV = present value   PMT = payment   FV = future value

P/Y = 1   C/Y=1   END

Simple Interest

$I = Prt, \qquad S = P + I$

Compound Interest

$$n = mt, \qquad i = \frac{r}{m}, \qquad S = P(1+i)^n = P\left(1 + \frac{r}{m}\right)^{mt}, \qquad S = Pe^{rt}$$

$$\text{APY} = \left(1 + \frac{r}{m}\right)^m - 1 = (1+i)^m - 1, \qquad \text{APY} = e^r - 1$$

Future Value of an Ordinary Annuity

$$S = R \cdot s_{\overline{n|}\,i} = R \cdot \left[\frac{(1+i)^n - 1}{i}\right]$$

Present Value of an Ordinary Annuity

$$A_n = R \cdot a_{\overline{n|}\,i} = R \cdot \left[\frac{1 - (1+i)^{-n}}{i}\right]$$

Amortization Formula

$$R = A_n \cdot \left[\frac{i}{1 - (1+i)^{-n}}\right]$$