

Quiz 2 will cover the following material:

All material covered in Classes 1 and 2

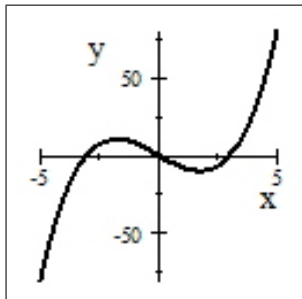
Problems #1-29 from Are You Ready For Calculus?

The following Sample Quiz is intended to demonstrate the length of the quiz and the difficulty level of the questions.

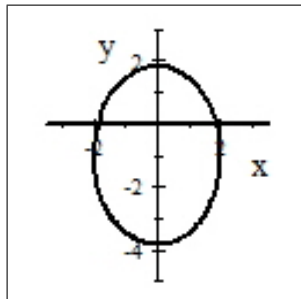
It is not intended as a comprehensive review or list of the type of questions that can appear on Quiz 2.

### Sample Quiz 2

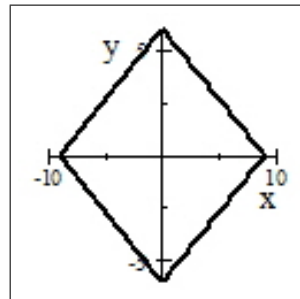
1. Which of the following graphs belong to a function?



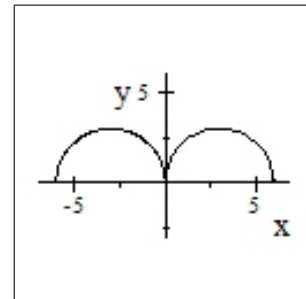
(a)



(b)



(c)



(d)

2. Completely factor  $3x^6 - 3x^2$  over the real number.
3. A small object is moving along a vertical line. Its location is given by the function  $L(t) = -t^3 + 4t$  where  $t$  is measured in seconds,  $L$  is measured in meters. Find the average velocity of the object between  $t_1 = 1$  s and  $t_2 = 4$  s.

4. Simplify the given expression.  $\frac{x^2 - 4x - 5}{x^2 - 25}$

5. a) Solve the given equation over the real numbers. Use exact values.

$$9x^2 = 6x + 4$$

- b) Check your smaller solution using exact values.

6. Give a complete analysis of the function  $f(x) = -2x^2 - 16x - 30$  on domain  $[-5, 2]$

## Answers

1. (a) and (d)

2.  $3x^2(x^2 + 1)(x - 1)(x + 1)$

3.  $-17 \frac{\text{m}}{\text{s}}$

4.  $\frac{x + 1}{x + 5}$

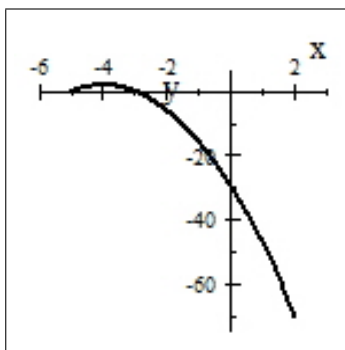
5. a)  $x_1 = \frac{1 - \sqrt{5}}{3}$  and  $x_2 = \frac{1 + \sqrt{5}}{3}$

b) If  $x = \frac{1 - \sqrt{5}}{3}$ , then

$$\text{LHS} = 9x^2 = 9 \left( \frac{1 - \sqrt{5}}{3} \right)^2 = 9 \cdot \frac{6 - 2\sqrt{5}}{9} = 6 - 2\sqrt{5}$$

$$\text{RHS} = 6 \left( \frac{1 - \sqrt{5}}{3} \right) + 4 = 2(1 - \sqrt{5}) + 4 = 2 - 2\sqrt{5} + 4 = 6 - 2\sqrt{5}$$

6.  $f(x) = \begin{cases} -2x^2 - 16x - 30 \\ -2(x + 4)^2 + 2 \\ -2(x + 3)(x + 5) \end{cases}$



$y$ -intercept:  $(0, -30)$   $x$ -intercepts:  $(-5, 0)$  and  $(-3, 0)$   $f(2) = -70 = -6 = -70$

maximum:  $(4, 2)$  minimum:  $(2, -70)$  range:  $[-70, 2]$  not one-to-one