Dawson College: Functions and Trigonometry: 201-009-50-S1: Fall 2008

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Quiz 6

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. pg.75#58 *(3 marks)* Find $\frac{f(x+h)-f(x)}{h}$ and simplify completely:

$f(x) = \frac{10}{x} + 2$

$$\frac{f(x+h)-f(x)}{h}$$

$$= \frac{\frac{10}{x+h} + 2 - \left[\frac{10}{x} + 2\right]}{h}$$

$$= \frac{\frac{10}{x+h} - \frac{10}{x}}{h}$$

$$= \frac{\frac{10x}{(x+h)x} - \frac{10(x+h)}{x(x+h)}}{h}$$

$$= \frac{\frac{10x - 10x - 10h}{x(x+h)}}{h}$$

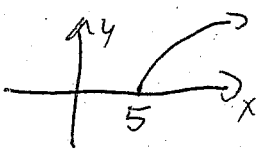
$$= \frac{\frac{-10h}{x(x+h)}}{h}$$

$$= \frac{-10h}{x(x+h)} \cdot \frac{1}{h} = \frac{-10}{x(x+h)}$$

Question 2. pg.74#32 *(2 marks)* Determine the domain and range of $y = \sqrt{x-5}$.

D: $[5, \infty)$

R: $[0, \infty)$



Question 3. pg.90#8g *(5 marks)* Graph the parabola, noting the intercepts, the vertex, the axis of symmetry, and the range.

$f(x) = 4x^2 - 4x + 1$

$$f(x) = 4\left[x^2 - x + \frac{1}{4}\right]$$

$$= 4\left[x^2 - x + \frac{1}{4} - \frac{1}{4} + \frac{1}{4}\right]$$

$$= 4\left[\left(x - \frac{1}{2}\right)^2 + 0\right]$$

$$= 4\left(x - \frac{1}{2}\right)^2$$

$\therefore$ vertex $\left(\frac{1}{2}, 0\right)$

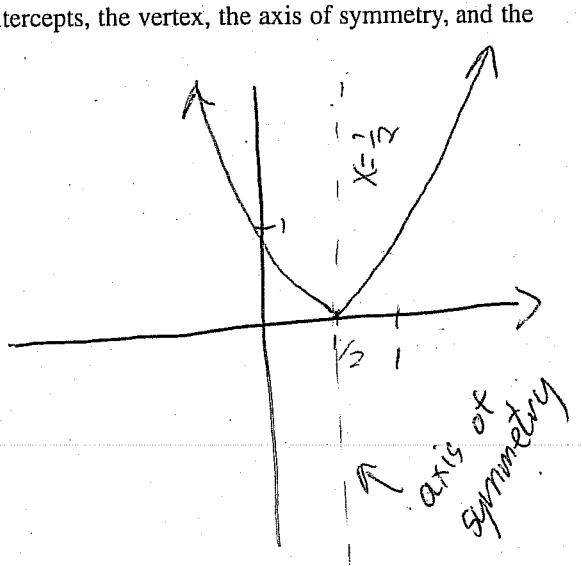
y-int: $(0, 1)$

x-int: $0 = 4x^2 - 4x + 1$

$0 = (2x-1)^2$

$2x - 1 = 0$

$x = \frac{1}{2}$



Range: $[0, \infty)$