Dawson College: **Remedial Activities For Secondary V Mathematics**: 201-015-50-S3: Fall 2018

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Quiz 9

This quiz is graded out of 14 marks. No books, watches, 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. Given $f(x) = -x^2 + 4x - 1$.

a. *(0.5 mark)* Find the y-intercept of $f(x)$.

$(0, f(0)) = (0, -1)$

b. *(2 marks)* Find the x-intercept(s) of $f(x)$, if any.

$0 = f(x)$

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

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \dfrac{-4 \pm \sqrt{(4)^2 - 4(-1)(-1)}}{2(-1)}$

$= \dfrac{-4 \pm \sqrt{12}}{-2}$

$= \dfrac{-4 \pm 2\sqrt{3}}{-2}$

$= 2 \pm \sqrt{3}$

$\doteq 0.27$ and 3.73

c. *(1.5 marks)* Find the vertex of $f(x)$.

$\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$

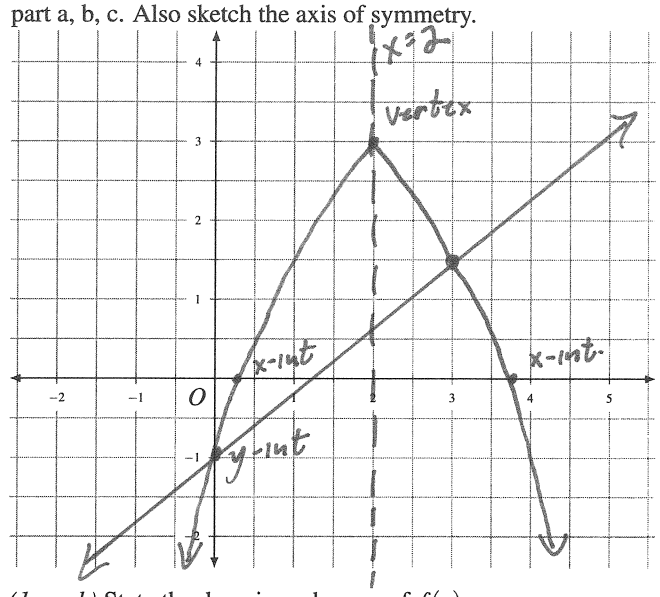
$= \left(\frac{-4}{2(-1)}, f\left(\frac{-4}{2(-1)}\right)\right)$

$= (2, f(2))$

$= (2, -(2)^2 + 4(2) - 1)$

$= (2, 3)$

d. *(4 marks)* Sketch the graph and label $f(x)$ and the points found in part a, b, c. Also sketch the axis of symmetry.



e. *(1 mark)* State the domain and range of $f(x)$.

Domain: $\mathbb{R}$ Range: $(-\infty, 3]$

Question 2. *(5 marks)* Find the intersection(s) of the following graphs: $y = -x^2 + 4x - 1$ and $y = x - 1$. Write the intersection(s) as ordered pairs. Sketch the line using the points of intersection(s) on the same axes as Question 1d.

Lets find the intersection of the two graphs

$x - 1 = -x^2 + 4x - 1$

$x^2 - 3x = 0$

$x(x-3) = 0$

$x = 0$ $\quad$ $x - 3 = 0$

$x = 3$

$x = 0$: $y = 0 - 1 = -1$

$\therefore$ intersection at $(0, -1)$

$x = 3$: $y = 3 - 1 = 2$

$\therefore$ intersection at $(3, 2)$