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

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Quiz 7

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. *(3 marks)* Find x if the distance between $(x,1)$ and $(2,5)$ is $2\sqrt{10}$.

$$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

$$2\sqrt{10} = \sqrt{(2-x)^2 + (5-1)^2}$$

$$(2\sqrt{10})^2 = \left(\sqrt{(2-x)^2 + 4^2}\right)^2$$

$$4 \cdot 10 = (2-x)^2 + 16$$

$$40 = (2-x)^2 + 16$$

$$24 = (2-x)^2$$

$$\pm\sqrt{24} = 2-x$$

$$x = 2 \pm \sqrt{24}$$

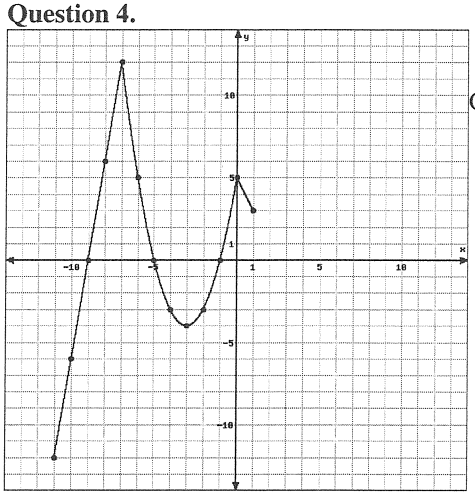
Question 2. *(1 mark)* Find the center of the circle given the 2 endpoints of a diameter: $(-8,2)$ and $(2,4)$

$$M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = \left(\frac{-8+2}{2}, \frac{2+4}{2}\right) = \left(\frac{-6}{2}, \frac{6}{2}\right) = (-3, 3)$$

Question 3. *(1 mark)* Find the radius of the circle whose equation is: $(x-3)^2 + y^2 = 20$

$$r = \sqrt{20} = \sqrt{4 \cdot 5} = 2\sqrt{5}$$

Question 4.



Given the graph of $y = f(x)$.

a. *(1 mark)* State the domain of $f(x)$.

$[-11, 1]$

b. *(1 mark)* State the range of $f(x)$.

$[-12, 12]$

c. *(1 mark)* Determine $f(-6)$.

$f(-6) = 5$

d. *(1 mark)* Determine all x such that $f(x) = 0$.

$x = -1, -5, -9$

Question 5. *(5 marks)* Given $f(x) = \frac{x}{x+1}$, simplify completely the following expression $\frac{f(x+h)-f(x)}{h}$.

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

$$= \frac{\frac{x+h}{x+h+1} - \frac{x}{x+1}}{h}$$

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

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

$$= \frac{\cancel{x^2} + \cancel{x} + \cancel{hx} + h - [\cancel{x^2} + \cancel{xh} + \cancel{x}]}{h(x+h+1)(x+1)}$$

$$= \frac{\cancel{h}}{\cancel{h}(x+h+1)(x+1)}$$

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