Dawson College: **Functions and Trigonometry**: 201-009-50-C1: Winter 2008

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Quiz 4

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.66#26 (4 marks)
Find the *distance* and the *midpoint* of the line segment defined by the points $(3\sqrt{2},4\sqrt{5})$ and $(\sqrt{2},-\sqrt{5})$:

$$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$=\sqrt{(\sqrt{2}-3\sqrt{2})^2+(-\sqrt{5}-4\sqrt{5})^2}$$
$$=\sqrt{(-2\sqrt{2})^2+(-5\sqrt{5})^2}$$
$$=\sqrt{(-2)^2(\sqrt{2})^2+(-5)^2(\sqrt{5})^2}$$
$$=\sqrt{4(2)+25(5)}$$
$$=\sqrt{125+8}$$
$$=\sqrt{133}$$

$$m=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$
$$=\left(\frac{3\sqrt{2}+\sqrt{2}}{2},\frac{4\sqrt{5}-\sqrt{5}}{2}\right)$$
$$=\left(\frac{4\sqrt{2}}{2},\frac{3\sqrt{5}}{2}\right)=\left(2\sqrt{2},\frac{3\sqrt{5}}{2}\right)$$

Question 2. pg.75#47 (2 marks)
Find the *domain* of the function:

$$f(x)=\frac{\sqrt{x}}{1-x}$$

For $f(x)$ to be defined the denominator can not be equal to zero. $\therefore$ $x \neq 1$

In addition x can not be negative since $\sqrt{x}$ would be undefined. The domain is all the real numbers minus the negative real number and 1.

$\therefore$ Domain $=[0,1)\cup(1,\infty)$

Question 3. pg.74#31 (4 marks)
Determine the *domain* and *range* of the function:

$$y=\sqrt{4-x^2}$$

The number evaluated by the square root can not be negative or else the function is undefined.

$\therefore$ $4-x^2 \geq 0$
$4 \geq x^2$
$2 \geq x \geq -2$

$\therefore$ the domain is $[-2,2]$

The range is the collection of all the points evaluated by the function from values of the domain.

Hence when $x=0 \Rightarrow y=2$
$x=2 \Rightarrow y=0$
$x=-2 \Rightarrow y=0$

$\therefore$ Range is $[0,2]$ since the min and the max of the function is 0, 2 respectively and the function