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

Name: _____

Student ID: _____

Test 2

This test is graded out of 40 marks. No books, notes, graphing calculators 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.

Question 1. *(4 marks)* Find the *distance* and the *midpoint* of the line segment between the points $(1,3)$ and $(4,5)$.

Question 2. *(2 marks)* Find the domain of f.

$$f(x) = \frac{15}{x^3 - 9x}$$

Question 3. *(4 marks)* Use the x and y intercepts to graph the linear function.

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

Question 4. *(4 marks)* Find the equation of the line that passes through the point $(3,3)$ and is perpendicular to the line $x+4y=10$.

Question 5. *(6 marks)* Graph the parabola $y=-2x^2+4x+3$ and give its intercepts, vertex and range.

Question 6. *(2 marks)* Find $(f \circ g)(x)$ and $(g \circ f)(x)$ if $f(x) = \frac{1}{x}$ and $g(x) = \sqrt{x-1}$.

Question 7. *(4 marks)* Find $f^{-1}(x)$ if $f(x) = 2(x+4)^3 - 1$.

Question 8. *(4 marks)* Graph the exponential $y = 2^{x-1} + 3$.

Question 9. *(5 marks)* Solve for x:

$$\ln(x^2 - 9) - \ln(x + 3) = \ln 2$$

Question 10. *(5 marks)* Solve for x:

$$5 + e^{x-3} = 27$$

Bonus. *(3 marks)*
If $f(x) = \frac{x}{x+2}$, find all values of x so that $f(x) = (f \circ f)(x)$.