Dawson College: **Business Mathematics**: 201-801-DW Group 12: Winter 2009 January 18, 2009

Name: Solution

Student ID: _____

Test 1

No books are 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. *(2 marks)* Write the percent 0.11% into a fraction and into a decimal.

$0.11\% = \frac{0.11}{100} = \frac{11}{10000} = 0.0011$

Question 2. *(1 mark)* Bring the fraction $\frac{2.25}{5.5}$ to higher terms to eliminate the decimals. Write your final answer in lowest terms.

$\frac{2.25}{5.5} = \frac{(2.25)(4)}{(5.5)(4)} = \frac{9}{22}$

Question 3. *(1 mark)* 85% of what number is 4828?

$0.85x = 4828 \Rightarrow x = 5680$, THE NUMBER IS 5680

Question 4. *(3 marks)* Simplify the following:

$$3\left[\frac{3(2-5)+2(3^3)}{5(6-3)}\right]+4^2 = 3\left[\frac{3(-3)+2(27)}{5(3)}\right]+16$$

$$= 3\left[\frac{-9+54}{15}\right]+16 = 3\left(\frac{45}{15}\right)+16 = 3(3)+16$$

$$= 25$$

Question 5. *(3 marks)* Simplify the following:

$$(2x-3)(x+2)-3(1-x)(x+5)$$

$$= (2x^2+4x-3x-6)-3(x+5-x^2-5x)$$

$$= (2x^2+x-6)-3(-x^2-4x+5)$$

$$= 2x^2+x-6+3x^2+12x-15$$

$$= 5x^2+13x-21$$

Question 6. *(2 marks)* Expand the following:

$(x-y)(y^2-2y+3x^2-1) = x(y^2-2y+3x^2-1) - y(y^2-2y+3x^2-1)$

$= xy^2 - 2xy + 3x^3 - x - y^3 + 2y^2 - 3x^2y + y$

$= 3x^3 - 3x^2y - x - 2xy + xy^2 - y^3 + 2y^2 + y$

Question 7. *(3 marks)* Simplify the following:

$\frac{(x^{-2}y)^2y^{-2}}{(x^3y^{-2})^2} = \frac{x^{-4}y^2y^{-2}}{x^6y^{-4}} = \frac{x^{-4}y^0}{x^6y^{-4}} = \frac{y^4}{x^6x^4}$

$= \frac{y^4}{x^{10}}$

Question 8. *(2 mark)* Evaluate the following to two decimal places:

$\ln\left(\frac{3}{e^7}\right) = \ln 3 - \ln e^7 = \ln 3 - 7\ln e$

$= \ln 3 - 7 = -5.90$

Question 9. *(1 mark)* Rewrite the exponential $2^{-3} = \frac{1}{8}$ as a logarithm.

$\log_2 \frac{1}{8} = -3$

Question 10. *(1 mark)* Rewrite the logarithm $\ln e = 1$ as an exponential.

$e^1 = e$

Question 11. *(1 mark each)*
Evaluate the following to two decimal places:

1. $27^{\frac{4}{9}} = 4.33$
2. $\sqrt{26} = 5.10$
3. $\frac{1-5^{-1}}{5} = 0.16$
4. $\sqrt[3]{18} = 2.62$

Question 12. *(2 marks)*
Let $i = 0.035,$, $n = 2$. Evaluate S to two decimal places:

$$S = \left[\frac{(1+i)^n - 1}{i}\right] = \left[\frac{(1+0.035)^2 - 1}{0.035}\right]$$

$$= \frac{0.071225}{0.035} = 2.04$$

Question 13. *(2 marks)*
Solve for r in the following equation:

$$S = P(1+rt)$$

$$\frac{S}{P} = 1 + rt \Rightarrow \frac{S}{P} - 1 = rt \Rightarrow \boxed{\frac{S}{Pt} - \frac{1}{t} = r}$$

Question 14. *(3 marks)*
Solve for x:

$$1 + 3(x-2) + (6x-2) - (2x-1) = 2(2x-2)$$

$$1 + 3x - 6 + 6x - 2 - 2x + 1 = 4x - 4$$

$$7x - 6 = 4x - 4$$

$$3x = 2$$

$$x = \frac{2}{3}$$

Question 15. *(3 marks)*
Solve for x:

$$\frac{1}{4}(5x-1)-\frac{4}{3}(4x-2)=12-\frac{3}{7}x$$

LCD = 84

$84\cdot\frac{1}{4}(5x-1)-84\cdot\frac{4}{3}(4x-2)=84(12)-84\cdot\frac{3}{7}x$

$21(5x-1)-112(4x-2)=1008-36x$

$105x-21-448x+224=1008-36x$

$-343x+203=1008-36x$

$-307x=805 \Rightarrow x=-\frac{805}{307}$

Question 16. *(2 marks)*
Solve for x in the proportion $2:x=17:12$

$\frac{2}{x}=\frac{17}{12} \Rightarrow 2(12)=17x \Rightarrow \frac{24}{17}=x$

Question 17. *(2 marks)*
Change the ratio 70 : 42 : 56 to lowest terms.

$70:42:56=(70\div14):(42\div14):(56\div14)=5:3:4$

Question 18. *(4 marks)*Toni's Pizza Shack takes an order for 30 Pizza's. The order is made up of cheese and pepperoni pizzas and requires 5 times more cheese pizzas than pepperoni. How many of each type of pizza are in the order.

LET x BE THE NUMBER OF PEPPERONI PIZZAS

THEN $5x$ = # OF CHEESE PIZZAS

$\therefore x+5x=30$

$6x=30$

$x=5$

$\therefore$ THE ORDER HAD 5 PEPPERONI AND

$5(5)=25$ CHEESE PIZZAS

Question 19. *(4 marks)* If a business has a net income of \$253000 and is split between three investors in the ratio $\frac{1}{6} : \frac{1}{2} : \frac{1}{4}$. How much would each investor get?

$\frac{1}{6} : \frac{1}{2} : \frac{1}{4} = 12\left(\frac{1}{6}\right) : 12\left(\frac{1}{2}\right) : 12\left(\frac{1}{4}\right) = 2 : 6 : 3$

OF PARTS = $2 + 6 + 3 = 11$ EACH PART = $\frac{253000}{11} = 23000$

1ST INVESTOR GETS $(23000)(2) = \$46000$

2nd INVESTOR GETS $(23000)(6) = \$138000$

3rd INVESTOR GETS $(23000)(3) = \$69000$

Question 20. *(4 marks)* On a trip a motorist purchased gasoline as follows: 43 litres at 91.9 cents per litre; 77 litres at 89.5 cents per litres; 62 litres at 95 cents per litre; and 31 litres at 81.2 cents per litre. What is the average cost per litre?

TOTAL COST $= (43)(91.9) + (77)(89.5) + (62)(95) + (31)(81.2)$

$= 19250.4¢$

TOTAL # LITRES $= 43 + 77 + 62 + 31 = 213$

AVERAGE COST PER LITRE $= \frac{19250.4}{213} = 90.4¢$ PER LITRE

Question 21. *(4 marks)* A local jeweler is selling off some of his gold inventory. She sells $3\frac{1}{2}$ ounces at a price of \$1067.60 per ounce; $2\frac{1}{4}$ ounces at a price of \$947.60 per ounce; and $5\frac{3}{4}$ ounces at a price of \$886.75 per ounce. How much did she obtain from the sale of her inventory?

TOTAL $= \left(3\frac{1}{2}\right)(1067.60) + \left(2\frac{1}{4}\right)(947.60) + \left(5\frac{3}{4}\right)(886.75)$

$= \$10967.51$