Wed. Oct 17, 2012 MATH 210 Quiz 5

Name: (print) Solutions.

Each problem is worth 2 points. Show all your work.

1. Calculate the following mentally and show how you did it:

(a) $(2^3)^5 \div 2^9$

$(2^3)^5 = 2^{3\times5} = 2^{15}$

$2^{15} \div 2^9 = 2^{15-9}$

$= 2^6 = 64.$

(b) $512\,000 \div 320$ $= 51200 \div 32$

$= (512 \div 32) \times 100$

$512 = 2^9$

$32 = 2^5$

$512 \div 32 = 2^{9-5}$

$= 2^4 = 16.$

1600

2. Simplify as much as possible, factoring the numbers and leaving the answer in exponential form:

$$\frac{a^3 \cdot (bc^3)^2 \cdot (ac)^0}{c^3 \cdot (ab)^2 \cdot b} = \frac{a^3 b^2 c^6}{c^3 b^3 a^2}$$

$$= \frac{a^{3-2} c^{6-3}}{b^{3-2}} = \frac{ac^3}{b}.$$

Please turn over...

3. Give a *teacher's solution* using algebra: *Ryan bought 3 books and a magazine. He paid $30 to the cashier and received $5 change. If the magazine cost twice as much as each book, find the cost of the magazine.*

B - cost of the book
M - cost of the magazine

$$\begin{cases} 3B + M = 30 - 5 \\ M = 2B \end{cases}$$

$$\Rightarrow \quad 3B + 2B = 25$$

$$5B = 25$$

$$B = 5$$

$$M = 2B = 10.$$

4. Illustrate the identity $(x + y)(a + b) = xa + xb + ya + yb$ by a rectangular array.