

PRACTISE TEST #1
MATH 171 Sept 15th '08

SOLUTIONS

① Simplify the following exponential expressions, leaving only positive exponents (10 marks)

a $5x^0 = \boxed{5}$

b $-y^{-3} = \boxed{-\frac{1}{y^3}}$

c $-(-z)^6 = \boxed{-z^6}$

d $\frac{(4t)^{-1}}{4t^0} = \boxed{\frac{1}{16t}}$

e $by^2(-b^2y)^2 = by^2(b^4y^2) = \boxed{b^5y^4}$

② Evaluate the following expressions & express your answer in both scientific & exponential form. (10 marks)

a $\frac{22000}{0.0003} = \frac{2.2 \times 10^4}{3 \times 10^{-4}} = 0.73 \times 10^8 = \boxed{\begin{matrix} = 7.3 \times 10^7 \text{ sci} \\ = 73 \times 10^6 \\ = 73M \text{ eng} \end{matrix}}$

b $2.5 \times 10^{10} - 1.4 \times 10^7$
 $= 2.5 \times 10^{10} - 0.0014 \times 10^{10}$

$= \boxed{2.4986 \times 10^{10} \text{ sci} \quad 24.986 \times 10^9 = 24.986 \text{ G eng}}$

c) $(3 \times 10^{-12})^{-3} = 3^{-3} \times 10^{36} = \frac{1}{27} \times 10^{36}$

$= 3.7 \times 10^{34} \text{ sci}$
 $= 37 \times 10^{33} \text{ Eng}$

d) $\frac{(2.1 \times 10^{-6})(3.1 \times 10^2)^4}{5.72 \times 10^{-4}}$

$= 3.39 \times 10^7 \text{ sci}$
 $= 33.9 \times 10^6 \text{ Eng}$
 $= 33.9 \text{ M}$

3 Simplify the following expressions (6 marks)

a) $(3x+1)^2 - (x-3)^2 = (9x^2 + 6x + 1) - (x^2 - 6x + 9)$
 $= 8x^2 + 12x - 8$

b) $2x(x^2-3) + x^3 - (x+1)(x-2)$
 $= 2x^3 - 6x + x^3 - (x^2 - x - 2) = 3x^3 - x^2 - 5x + 2$

4 Perform a long division (4 marks)

$$x^3 - 2x^2 + 1 \div x - 1 = x^2 - x - 1$$

$$\begin{array}{r} x^2 - x - 1 \\ x-1 \overline{) x^3 - 2x^2 + 1} \\ \underline{-(x^3 - x^2)} \\ -x^2 + 1 \\ \underline{-(-x^2 + x)} \\ -x + 1 \\ \underline{-(-x + 1)} \\ 0 \end{array}$$

5 A ski lift takes a skier up a slope at 50m/min. The skier then skis down the slope at 150m/min. If one round trip takes 24min.

How long is the slope? (10 marks)

variable	unit	uphill	downhill
speed	m/min	50	150
time travelling	min	x	24-x
distance travelled	m	50x	150(24-x)

distance up = distance down
 $50x = 150(24-x)$
 $50x = 3600 - 150x$
 $200x = 3600$
 $x = 18 \text{ minutes}$

length of slope = distance up = $50(18) = 900$