

October 15, 2007

Algebra of Quadratics

Ex 1: Give degree of each polynomial

a) $3x^2 + 6x^4 - 2x$
 $\therefore 4$

b) $3x^3y^3 - 4x^2y^4 + x^5y^6 + y^7$
 $\therefore 11$

c) $6x^2 - \frac{1}{3}x^5y^3z + 2x^4y^3z$
 $\therefore 9$

Ex 2: Write in descend order

a) $4x^2 - 2x^3 + x^4$
 $= x^4 - 2x^3 + 4x^2$

b) $6x^4 - 2x^2 - 3x^5 + 1$
 $= -3x^5 + 6x^4 - 2x^2 + 1$

c) $6 - 3x = -3x + 6$

Ex 3: Evaluate each expression.

a) $x^4 - 2x^3 + 3x$ for $x = -2$
 $= (-2)^4 - 2(-2)^3 + 3(-2) = 26$

b) $x^4 - y^3 + 2xy$ for $x = 1$ $y = 1$
 $= (1)^4 - (-1)^3 + 2(1)(-1) = 0$

$$c) x^5 + x^6 - y^2 - y \quad \text{for } x = -1 \quad y = -1$$

$$= (-1)^5 + (-1)^6 - (-1)^2 - (-1) = 0$$

Ex 4: Simplify

$$a) (3 + x^2) - (2 - x^2)$$

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

$$b) (x^3 - 5x^2 + x) - (2x - 4x^2 + 1) + (2x^2 - x)$$

$$= -x^3 - 5x^2 + x - 2x + 4x^2 - 1 + 2x^2 - x = x^3 + x^2 - 2x - 1$$

$$c) -(x - y) - (x + y) - (y - x)$$

$$= -x + y - x - y - y + x = -x - y$$

Ex 5: Simplify

$$a) \frac{24a^2b^3z^3}{2ab^5z} = \frac{12az^2}{b^2}$$

$$b) \frac{-3a^4b^{-2}c}{a^{-2}bc^{-2}} = \frac{-3c^3}{a^2b^3}$$

$$c) \frac{2x^3y^4z^5}{4xy^5z^{-2}} = \frac{1x^2z^{12}}{2y}$$

Ex 6: Expand & Simplify

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

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

$$= x^2 + 5x$$

$$b) 2y(1-y) - 3y(y^3-4)$$

$$= 2y - 2y^2 - 3y^4 + 12y$$

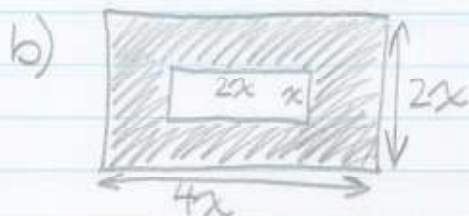
$$= -3y^4 - 2y^2 + 14y$$

$$\begin{aligned}
 c) & 2x - 3x(x+1) - 4x(1-x) \\
 & = 2x - 3x^2 - 3x - 4x + 4x^2 \\
 & = x^2 - 5x
 \end{aligned}$$

Ex 7: Find an expression for each



$$\begin{aligned}
 \text{surface area} &= 2(4zy) + 2(4yz) + 2(4xy) \\
 &= 8xz + 8yz + 8xy \\
 &= 8xyz
 \end{aligned}$$



Area of shaded region =

$$\begin{aligned}
 & A_{\text{big}} - A_{\text{small}} \\
 & (4x)(2x) - (2x)(x) \\
 & = 8x^2 - 2x^2 \\
 & = 6x^2
 \end{aligned}$$

