MPM2D

Polynomials & Factoring Review

1. State meanings for the following terms:

   a) Parts of a term b) Types of polynomials c) Name of functions by degree

2. State the degree of each polynomial.

   a) $3x + 4$ b) $5a^2 + 8a - 2$ c) 10 d) $6m^5n^4$ e) $2x^3y + 3x^6y^3 - 15xy^9$

3. Expand and simplify the following.

   a) $(3y^2 - 2y + 1) + (5y^2 - y - 4)$

   b) $(2x^2 - 3x - 5) - (2x^2 + 4x - 7)$

   c) $2(m-5) - 4(2m+1)$

   d) $4x(2x-3) - x(3x-1)$

   e) $(x-1)^2$

   f) $(2y-3)(2y+3)$

   g) $2(3x+1)^2 + 3(2x-1)(2x+1)$

   h) $3(x-1)^2 - 2(x+3)(x-4)$

4. State the nature of the real roots.

   a) $x^2 + 9 = 0$ b) $x^2 + 5x = 8$ c) $9x^2 + 12x = -4$

5. a) Write the final quadratic equation in standard form that has the following roots: -4 and 3.

   b) Write the final quadratic equation in standard form that has the following roots: -5 and $\frac{3}{4}$.

6. Factor each expression fully.

   a) $2x - 8xy$ b) $25a^2 - 9$ c) $x^2 + 7x + 12$ d) $y^2 - 11y + 28$

   e) $5b^2 - 14b + 8$ f) $10x^2 - 28x + 16$ g) $3d^2 - 432$ h) $6d^2 + 5d + 1$

   i) $56c^2 + 9c - 2$ j) $2g^2 - 2g - 24$ k) $-16 + 9x^2$ l) $x^2y^3z - 2xy^2$

   m) $8x^2 - 50$ n) $\frac{a^2}{64} - \frac{b^2}{49}$ o) $\frac{c^4}{16} - \frac{d^4}{81}$ p) $625m^8n^4 - 16p^8$

   q) $100 - (w-4)^2$ r) $x^2(y-2) - 4(y-2)$ s) $x^2 + xy + 2x + 2y$

ANSWERS:

1) Look at our "Polynomials" lesson notes for answers

2a) 1 **2b)** 2 **2c)** 0 **2d)** 9 **2e)** 10

3a) $8y^2 - 3y - 3$ **3b)** $-7x + 2$ **3c)** $-6m - 14$ **3d)** $5x^2 - 11x$ **3e)** $x^2 - 2x + 1$ **3f)** $4y^2 - 9$

3g) $30x^2 + 12x - 1$ **3h)** $x^2 - 4x + 27$

4a) no real roots **4b)** 2 real & distinct roots **4c)** 2 real & equal roots or 1 real & distinct root

5a) $x^2 + x - 12 = 0$ **5b)** $4x^2 + 17x - 15 = 0$

6a) $2x(1 - 4y)$ **6b)** $(5a + 3)(5a - 3)$ **6c)** $(x + 3)(x + 4)$ **6d)** $(x - 7)(x - 4)$ **6e)** $(5b - 4)(b - 2)$

6f) $2(5x - 4)(x - 2)$ **6g)** $3(d + 12)(d - 12)$ **6h)** $(3d + 1)(2d + 1)$ **6i)** $(8c - 1)(7c + 2)$ **6j)** $2(g - 4)(g + 3)$

6k) $(3x - 4)(3x + 4)$ **6l)** $xy^2(xyz - 2)$ **6m)** $2(2x + 5)(2x - 5)$ **6n)** $\left(\frac{a}{8} + \frac{b}{7}\right)\left(\frac{a}{8} - \frac{b}{7}\right)$ **6o)** $\left(\frac{c^2}{4} + \frac{d^2}{4}\right)\left(\frac{c}{2} + \frac{d}{3}\right)\left(\frac{c}{2} - \frac{d}{3}\right)$

6p) $(25m^4n^2 + 4p^4)(5m^2n + 2p^2)(5m^2n - 2p^2)$ **6q)** $(6 + w)(14 - w)$ **6r)** $(x + 2)(x - 2)(y - 2)$ **6s)** $(x + 2)(x + y)$