

MAT 099 Σ 5.3 #s 5, 7, 11, 15, 17, 19, 23, 33, 39,
41, 43, 56, 65, 67, 71, 79, 83, 86, 88

#s 1-10 Find the degree of each term.

(5) $-3xy^2$ is degree 3

(7) -8^7y^3 is degree 3

#s 11-18 Find the degree of each polynomial and indicate if it is a monomial, binomial, or trinomial, or none of these.

(11) $6x + 0.3$ is binomial of degree 1.

(15) -3^4xy^2 is monomial of degree 3

(17) $x^2y - 4xy^2 + 5x + y^4$ is polynomial of degree 4.

#s 19-24 $P(x) = x^2 + x + 1$, $Q(x) = 5x^2 - 1$. Find the following.

(19) $P(7) = 7^2 + 7 + 1 = 49 + 8 = \boxed{57 = P(7)}$

(23) $Q\left(\frac{1}{4}\right) = 5\left(\frac{1}{4}\right)^2 - 1 = 5\left(\frac{1^2}{4^2}\right) - 1 =$

$$5\left(\frac{1}{16}\right) - 1 = \left(\frac{5}{1}\right)\left(\frac{1}{16}\right) - 1 = \frac{(5)(1)}{(1)(16)} - 1$$

$$= \frac{5}{16} - 1 = \frac{5}{16} - \frac{1}{1} = \frac{5}{16} - \frac{1}{1} \cdot \frac{16}{16} = \frac{5}{16} - \frac{16}{16}$$

$$= \frac{5-16}{16} = \boxed{-\frac{11}{16}}$$

MAT 099 S.3 #s 33, 39, 41, 43, 56, 65, 67, 71,
79, 83ab, 88

#s 29-36 Simplify by collecting like terms.

$$(33) \quad 4xy + 2x - 3xy - 1 = \boxed{xy + 2x - 1}$$

#s 37-80 Perform the indicated operations.

$$(39) \quad \text{Add } (x^2 + xy - y^2) \text{ \& } (2x^2 - 4xy + 7y^2)$$
$$x^2 + xy - y^2 + (2x^2 - 4xy + 7y^2) = \boxed{3x^2 - 3xy + 6y^2}$$

$$(41) \quad \begin{array}{r} x^2 - 6x + 3 \\ + (2x + 5) \\ \hline x^2 - 4x + 8 \end{array}$$

$$(43) \quad (9y^2 - 7y + 5) - (8y^2 - 7y + 2)$$
$$= 9y^2 - 7y + 5 - 8y^2 + 7y - 2 = \boxed{y^2 + 3}$$

$$(56) \quad (3x^2 + 6xy + 3y^2) - (8x^2 - 6xy - y^2)$$
$$= 3x^2 + 6xy + 3y^2 - 8x^2 + 6xy + y^2 = \boxed{-5x^2 + 12xy + 4y^2}$$

$$(65) \quad -3 + 4x^2 + 7xy^2 + (2x^3 - x^2 + xy^2)$$
$$= 2x^3 + 3x^2 + 8xy^2 - 3$$

$$(67) \quad \begin{array}{r} 6y^2 - 6y + 4 \\ - (-y^2 - 6y + 7) \\ \hline 7y^2 \qquad -3 \end{array} \quad \boxed{7y^2 + 3}$$

MAT 099 § 5.3 #s 71, 79, 83a, b, 88

$$(71) \quad \frac{1}{2}x^2 - \frac{1}{3}x^2y + 2y^3 + \frac{1}{4}x^2 - \frac{8}{3}x^2y^2 - \frac{1}{2}y^3$$

$$= \frac{1}{2}x^2 + \frac{1}{4}x^2 - \frac{1}{3}x^2y + 2y^3 - \frac{1}{2}y^3 - \frac{8}{3}x^2y^2$$

$$= \boxed{\frac{3}{4}x^2 - \frac{1}{3}x^2y + \frac{3}{2}y^3 - \frac{8}{3}x^2y^2}$$

Scratch:

$$\frac{1}{2}x^2 + \frac{1}{4}x^2 = \frac{x^2}{2} + \frac{x^2}{4} = \frac{x^2}{2} - \frac{2}{2} + \frac{x^2}{4} = \frac{2x^2}{4} + \frac{x^2}{4}$$

$$= \frac{3x^2}{4} = \frac{3}{4}x^2$$

$$2y^3 - \frac{1}{2}y^3 = \frac{2y^3}{1} - \frac{y^3}{2} = \frac{2y^3}{1} \cdot \frac{2}{2} - \frac{y^3}{2}$$

$$= \frac{4y^3}{2} - \frac{y^3}{2} = \frac{4y^3 - y^3}{2} = \frac{3y^3}{2} = \frac{3}{2}y^3$$

$$(79) \quad \frac{2}{3}x^2 - \frac{1}{6}x + \frac{5}{6} - \left(\frac{1}{3}x^2 + \frac{5}{6}x - \frac{1}{6} \right)$$

$$= \frac{2}{3}x^2 - \frac{1}{6}x + \frac{5}{6} - \frac{1}{3}x^2 - \frac{5}{6}x + \frac{1}{6}$$

$$= \frac{2}{3}x^2 - \frac{1}{3}x^2 - \frac{1}{6}x - \frac{5}{6}x + \frac{5}{6} + \frac{1}{6}$$

$$= \frac{1}{3}x^2 - \frac{6}{6}x + \frac{6}{6} = \boxed{\frac{1}{3}x^2 - x + 1}$$

(83) Height of projectile is $P(t) = -16t^2 + 300t$
where t = seconds after firing.

$$(a) \quad t = 1 \text{ second} \quad P(1) = -16(1)^2 + 300(1) = -16 + 300 \\ = \boxed{284 \text{ feet.}}$$

$$(b) \quad P(2) = -16(2)^2 + 300(2) = -16(4) + 600 \\ = -64 + 600 \\ = \boxed{536 \text{ feet}}$$