

sec 4.3

11-613

<u>Ex</u>		<u>prob</u>
1	→	11
2	→	17
3	→	53
4	→	27
5	→	<del>35</del>
6	→	<del>41</del>
7	→	47
8	→	45
9	→	61
10	→	read, 69

4.4

EX

PROB

1 → 9

2 → 25, 31

3 → 35

FOIL 4 → 37 (see 4.5)

5 → 57

6 → 61

7 → 69

4.5

EX  
1, 2, 3, 4, 5

MOSTLY

FOIL

PROB

5, 9, 33, 39, 27

51, 57 (FOIL)

4.3

(11)  $(7t^2 - 3t - 6) + (2t^2 + 4t + 9)$

Diagram illustrating the addition of two polynomials:  $(7t^2 - 3t - 6) + (2t^2 + 4t + 9)$ . The terms are grouped by degree:  $9t^2$  (from  $7t^2 + 2t^2$ ),  $t$  (from  $-3t + 4t$ ), and  $3$  (from  $-6 + 9$ ).

$= 9t^2 + t + 3$

(17)  $(3x^6 + 2x^4 - x^3 - 5x) + (-x^6 + 3x^3 - 4x^2 + 7x^4)$

Diagram illustrating the addition of two polynomials:  $(3x^6 + 2x^4 - x^3 - 5x) + (-x^6 + 3x^3 - 4x^2 + 7x^4)$ . The terms are grouped by degree:  $2x^6$  (from  $3x^6 - x^6$ ),  $9x^4$  (from  $2x^4 + 7x^4$ ),  $2x^3$  (from  $-x^3 + 3x^3$ ), and  $-5x + 4x^2$  (from  $-5x - 4x^2$ ).

$= 2x^6 + 9x^4 + 2x^3 - 5x + 4x^2$

$= 2x^6 + 9x^4 + 2x^3 - 4x^2 - 5x$

(53)

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

Diagram showing the subtraction of the second polynomial from the first. The second polynomial is written as  $-x^3 - x^2 + 5$ . Arrows indicate the alignment of like terms:  $x^3$  with  $-x^3$ ,  $3x^2$  with  $-x^2$ , and  $1$  with  $5$ . A large arrow points from the first polynomial to the second, and a large arrow points from the second polynomial to the result below.

$$= 0 + 2x^2 + 6 = 2x^2 + 6$$

(27)

$$-3t^3 + 4t^2 - 7$$

$$-(-3t^3 + 4t^2 - 7)$$

$$3t^3 - 4t^2 + 7 \text{ preference}$$

change each sign

(3x4)  
↓

(i)

(ii)

Example 4

403

350

change signs

$$\begin{aligned} & -(-4x^4 + 6x^2 + \frac{3}{4}x - 8) \\ & = 4x^4 - 6x^2 - \frac{3}{4}x + 8 \end{aligned}$$

Announcement

Sec. 7.5, 7.6 test 3 Nov 18th

sec 7.7, CH 4

$$(46) \quad (4a^2 + a - 7) - (3 - 8a^3 - 4a^2)$$

$$4a^2 + a - 7 - 3 + 8a^3 + 4a^2$$

$8a^2$

$$= 8a^3 + 8a^2 + a - 10$$

47.

$$(3 + 5a + 3a^2 - a^3) - (2 + 4a - 9a^2 + 2a^3)$$

Diagram showing the subtraction of the second polynomial from the first. Arrows indicate the alignment of terms:

- $3$  and  $2$  are aligned.
- $5a$  and  $4a$  are aligned.
- $3a^2$  and  $9a^2$  are aligned.
- $-a^3$  and  $-2a^3$  are aligned.

The result of the subtraction is shown as:

$$3 + 5a + 3a^2 - a^3 - 2 - 4a + 9a^2 - 2a^3$$

Arrows from the result point to the terms in the original expression, with labels:  $1$  (under 3),  $a$  (under  $5a$ ),  $12a^2$  (under  $3a^2$ ), and  $-3a^3$  (under  $-a^3$ ).

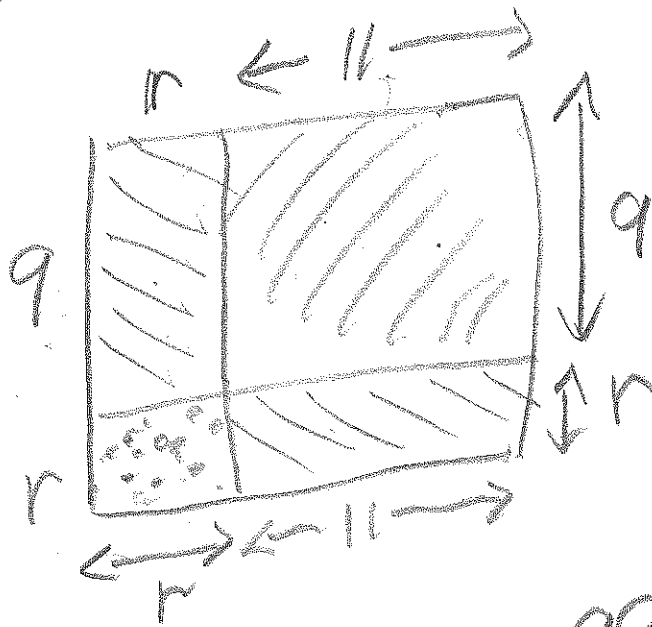
$$= 1 + a + 12a^2 - 3a^3$$

$$= \boxed{-3a^3 + 12a^2 + a + 1}$$

45.

$$(7x^3 - 2x^2 + 6) - (6 - 2x^2 + 7x^3)$$
$$7x^3 - 2x^2 + 6 - 6 + 2x^2 - 7x^3$$
$$= 0 \quad \text{Aha!}$$

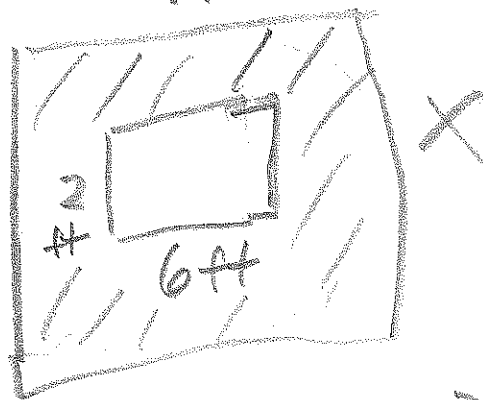
61.



$$\text{Area} = 9r + 9r + 11r + r^2$$

$$= r^2 + 20r + 99$$

69.



$$\begin{aligned} \text{area} &= x \cdot x - 2 \text{ ft} \cdot 6 \text{ ft} \\ &= x^2 - 12 \text{ ft}^2 \end{aligned}$$

$$\frac{4.4}{(9)} \text{ neg. pos}$$
$$(-x^3) \cdot (x^4)$$

$$= \text{neg} = -x^7$$

$$7 = 3 + 4$$

$$\text{EX: } x^3 \cdot x^4 = x^{4+3} = x^7$$

$$(25.) \quad 5x \cdot (4x + 1)$$

$$20x^2 + 5x \cdot 1$$

$$= 20x^2 + 5x$$

$$(31) \quad -3n^1 \cdot (2n^2 - 8n^1 + 1)$$

$$= -6n^3 + 24n^2 - 3n \cdot 1$$

$$= \textcircled{36} -6a^3 + 24a^2 - 3a$$

$$\textcircled{35}$$

$$\frac{2}{3} a^4 \cdot (6a^5 - 12a^3 - \frac{5}{8} a^2)$$

$$\frac{2}{3} \cdot 6 = \frac{12}{3} = 4 \rightarrow 4a^9 - 8a^7 - \frac{5}{12} a^8$$

$$\frac{2}{3} \cdot 12 = \frac{24}{3} = 8$$

$$\frac{2}{3} \cdot \frac{5}{8} a^2 = \frac{5}{12} a^2$$

$$\textcircled{37}$$

FOIL (see 4.5)

$$(x+3)(x+4)$$

$$= x^2 + 4x + 3x + 12$$

$$= x^2 + 7x + 12$$

(57)  $(x+3)(x+4)$

F O I L

$$x^2 + 4x + 3x + 4 \cdot 3$$

$$= x^2 + 7x + 12$$

(57)  $(x^2 - x + 3)(x + 1)$  NOT FOIL

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

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

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

Q1.

$$(2-7y) \cdot (3y^4 + y + 2)$$

$$= 3y^6 + y^3 + 2y^2 - 21y^4 - 7y - 14$$

$$= 3y^6 - 21y^4 + y^3 + 2y^2 - 7y - 14$$

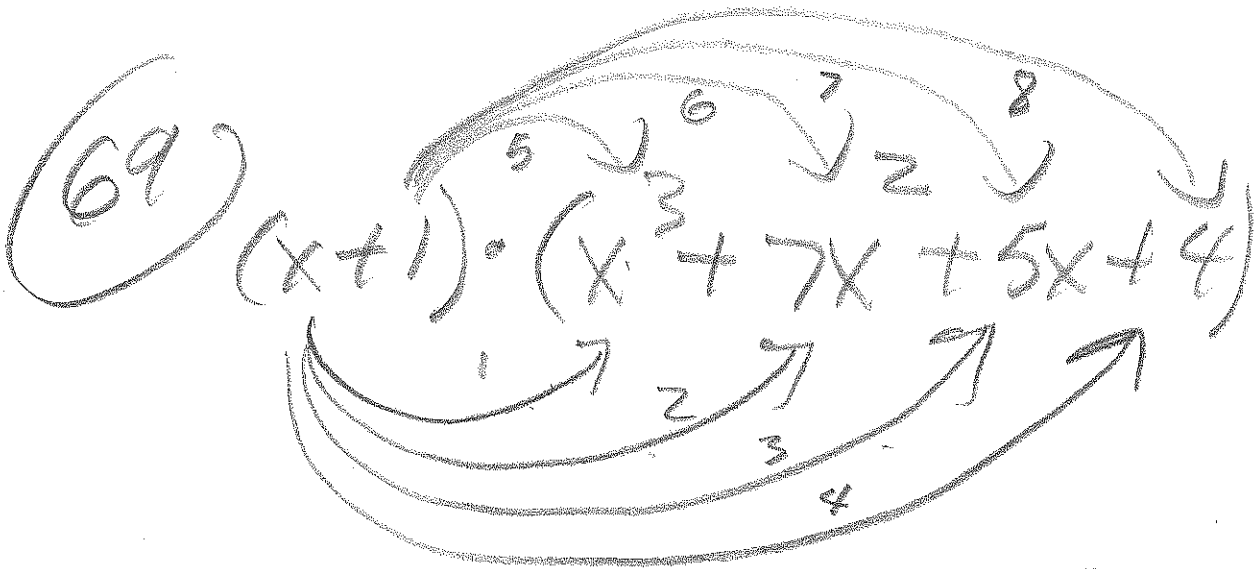
revisit Q5

$$(x+1) \cdot (x^2 - x + 3)$$

$$14 \cdot y^0 = 14 = 14$$

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

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



$$\begin{array}{cccc}
 \textcircled{1} & \textcircled{2} & \textcircled{3} & \textcircled{4} \\
 x^4 & + 7x^3 & + 5x^2 & + 4x \\
 + \textcircled{5} & \textcircled{6} & \textcircled{7} & \textcircled{8} \\
 + x^3 & + 7x^2 & + 5x & + 4
 \end{array}$$

$$= x^4 + 8x^3 + 12x^2 + 9x + 4$$

4.5

5, 9, 33, 39, 27, 51, 57  
(FOLL FEST)

4.5

5.

A diagram illustrating the multiplication of two polynomials,  $(x^2 + 2)$  and  $(x + 3)$ . The first polynomial is written as  $(x^2 + 2)$  and the second as  $(x + 3)$ . Arrows labeled 'F' (First) and 'O' (Outer) point from the terms of the first polynomial to the terms of the second. An arrow labeled 'I' (Inner) points from the terms of the second polynomial to the terms of the first. A large arrow labeled 'L' (Last) points from the entire expression to the result.

$$= x^3 + 3x^2 + 2x + 6$$

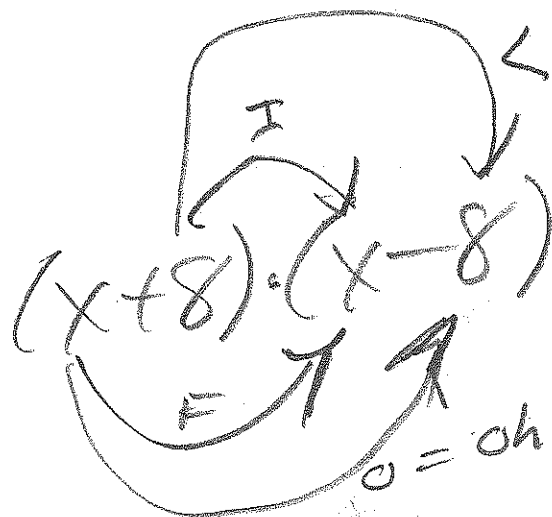
(9)

A diagram illustrating the multiplication of two polynomials,  $(y + 2)$  and  $(y - 3)$ . The first polynomial is written as  $(y + 2)$  and the second as  $(y - 3)$ . Arrows labeled 'F' (First) and 'O' (Outer) point from the terms of the first polynomial to the terms of the second. An arrow labeled 'I' (Inner) points from the terms of the second polynomial to the terms of the first. A large arrow labeled 'L' (Last) points from the entire expression to the result.

F	O	I	L
$y^2$	$-3y$	$+2y$	$-6$

$$= y^2 - y - 6$$

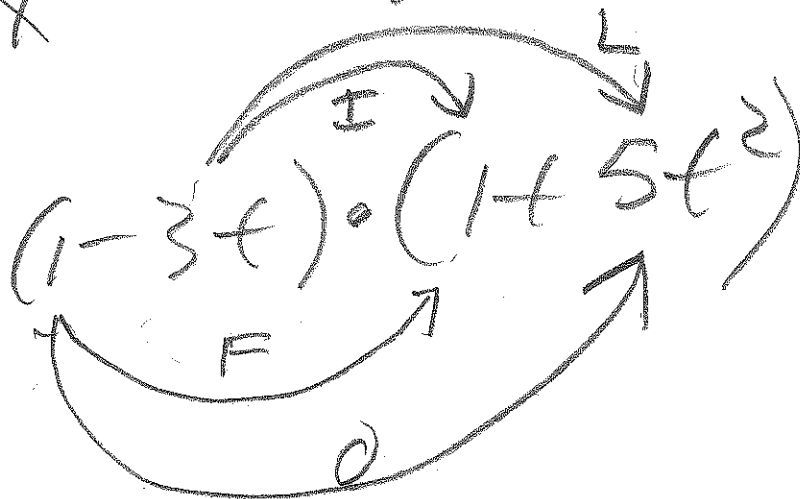
(39.)



$$= x^2 - 8x + 8x - 64$$

$$= x^2 - 64$$

(27.)



F      O      I      L

$$1 + 5t^2 - 3t - 15t^3$$

$$= -15t^3 + 5t^2 - 3t + 1$$

(57.)

$$(x+3)^2 = (x+3) \cdot (x+3)$$

$$= x^2 + 3x + 3x + 9$$

$$= x^2 + 6x + 9$$

(57.)

$$(t^4 + 3)^2 = ?$$

$$= (t^4 + 3) \cdot (t^4 + 3)$$

$$t^8 + 3t^4 + 3t^4 + 9 = t^8 + 6t^4 + 9$$

Nice example!

USE  
FOIL

$$(t^4 + 3)^3 = (t^4 + 3)(t^4 + 3)(t^4 + 3)$$

$$(t^8 + 6t^4 + 9) \cdot (t^4 + 3)$$

$$= t^{12} + 6t^8 + 9t^4 + 3t^8 + 18t^4 + 27$$

$$= t^{12} + 9t^8 + 27t^4 + 27$$

$$\text{Quiz 9} = \sec 4.3 \approx \underline{4.5}$$