

Notes: Multiplying Polynomials

Multiplying Polynomial by Polynomial:

$$(x+5)(2x^2+x+4)$$

$$2x^2(x) + x(x) + 4(x) + 2x^2(5) + x(5) + 4(5)$$

$$2x^3 + x^2 + 4x + 10x^2 + 5x + 20$$

$$\boxed{2x^3 + 11x^2 + 9x + 20}$$

Distribution

A) $(x+2)(x^2-5x+4)$

$$\begin{array}{r} x^3 - 5x^2 + 4x \\ + \quad 2x^2 - 10x + 8 \\ \hline x^3 - 3x^2 - 6x + 8 \end{array}$$

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

	x^2	$-4x$	$+1$
$3x$	$3x \cdot x^2$ $3x^3$	$-4x \cdot 3x$ $-12x^2$	$3x \cdot 1$ $+3x$
$+2$	$x^2 \cdot 2$ $+2x^2$	$-4x \cdot 2$ $-8x$	$2 \cdot 1$ $+2$

$$3x^3 - 12x^2 + 3x + 2x^2 - 8x + 2$$

$$\boxed{3x^3 - 10x^2 - 5x + 2}$$

Box Method

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

	$-2x^3$	$+5x$	-6
$3x$	$-6x^4$	$+15x^2$	$-18x$
-4	$8x^3$	$-20x$	24

$$\boxed{-6x^4 + 8x^3 + 15x^2 - 38x + 24}$$

More Practice!! Who's excited?! 😊

1) $(2x^2)(7x^4)$

$$(2 \cdot 7)(x^2 \cdot x^4)$$

$$14x^6$$

4) $4ab(2a^2+3b^3)$

$$2a^2(4ab) + 3b^3(4ab)$$

$$8a^3b + 12ab^4$$

7) $(4a^3-2b)(a-3b^2)$

	$4a^3$	$-2b$
a	$4a^4$	$-2ab$
$-3b^2$	$-12a^3b^2$	$6b^3$

$$4a^4 - 12a^3b^2 - 2ab + 6b^3$$

3) $(\frac{1}{3}a^5)(12a)(a^3)$

$$(\frac{1}{3} \cdot 12)(a^5 \cdot a \cdot a^3)$$

$$4a^9$$

6) $(2x-1)(3x+4)$

$$6x^2 + 8x - 3x - 4$$

$$6x^2 + 5x - 4$$

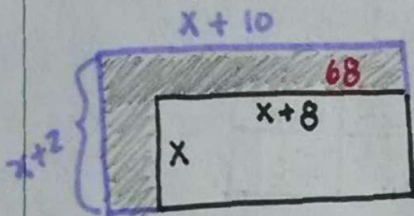
9) $(3x^2-4)(5x^3-2x^2+1)$

$$15x^5 - 6x^4 + 3x^2 - 20x^3 + 8x^2 - 4$$

$$15x^5 - 6x^4 - 20x^3 + 11x^2 - 4$$

Area Problem Notes

1) A rectangle is 8cm longer than it is wide. If its length and width are both increased by 2cm, its area is increased by 68cm². Find its original dimensions



$$L_0 = x + 8 \rightarrow \boxed{20} \quad L_N = x + 10$$

$$W_0 = x \rightarrow \boxed{12} \quad W_N = x + 2$$

$$A_0 = x(x + 8) \quad A_N = (x + 2)(x + 10)$$

$$\text{Original} + 68 = \text{New}$$

$$x(x + 8) + 68 = (x + 2)(x + 10)$$

$$x^2 + 8x + 68 = x^2 + 12x + 20$$

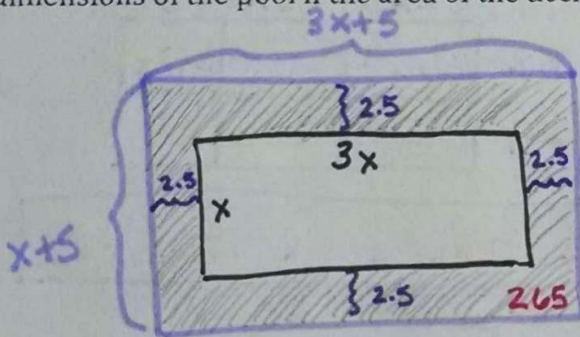
$$8x + 68 = 12x + 20$$

$$48 = 4x$$

$$x = 12$$

12cm by 20cm

2) A rectangular pool is three times as long as it is wide and is surrounded by a deck 2.5m wide. Find the dimensions of the pool if the area of the deck is 265m².



<u>Pool</u>	<u>Deck</u>	<u>Total</u>
$W = x \Rightarrow \boxed{12}$	265	$W = x + 5$
$L = 3x \Rightarrow \boxed{36}$		$L = 3x + 5$
$A = x(3x)$		$A = (3x + 5)(x + 5)$

$$\text{Pool} + \text{Deck} = \text{Total}$$

$$x(3x) + 265 = (3x + 5)(x + 5)$$

$$3x^2 + 265 = 3x^2 + 20x + 25$$

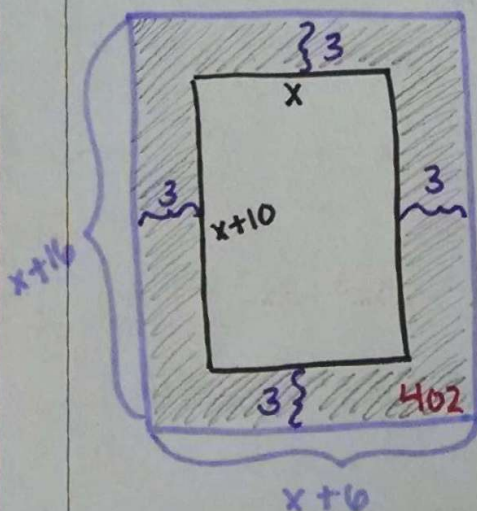
$$265 = 20x + 25$$

$$240 = 20x$$

$$x = 12$$

12 m x 36 m

3) An oil painting is 10 inches longer than it is wide and is bordered on all sides by a 3in wide frame. If the area of the frame is 402in², what are the dimensions of the painting?



<u>Picture</u>
$W = x \rightarrow \boxed{25.5}$
$L = x + 10 \rightarrow \boxed{35.5}$
$A = x(x + 10)$

<u>Total</u>
$W = x + 6$
$L = x + 16$
$A = (x + 6)(x + 16)$

$$\text{Frame} = 402$$

$$\text{Picture} + \text{Frame} = \text{Total}$$

$$x(x + 10) + 402 = (x + 6)(x + 16)$$

$$x^2 + 10x + 402 = x^2 + 22x + 96$$

$$10x + 402 = 22x + 96$$

$$306 = 12x$$

$$x = 25.5$$

25.5 in by 35.5 in