

1. Use an area model to multiply $(x-2)(x^2+4x+3)$.

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

2. a. Explain why $(x-2)(x^2+4x+3) = x^3+2x^2-5x-6$ can be rewritten as

$$\frac{x^3+2x^2-5x-6}{x-2} = x^2+4x+3.$$

Because division is the opposite of multiplication

b. We can use an area model to solve division problems as well, consider the quotient

$$\frac{2x^3-3x^2-18x-8}{x-4}$$

i. Explain why $x-4$ is on the outside of the rectangle, while $2x^3$ is inside the rectangle.

x	$2x^3$			
-4				

Because outside multiply. Inside add to equal the sum

ii. If the rectangle below represents $\frac{2x^3-3x^2-18x-8}{x-4}$, what does A and B have to equal? Explain how you know.

$$A = 2x^2$$

x	$2x^3$			
-4	B			

Outsides multiply.

$$B = -8x^2$$

iii. If the rectangle below represents $\frac{2x^3-3x^2-18x-8}{x-4}$, explain why $B+C = -3x^2$?

	A			
x	$2x^3$	C		
-4	B			

Inside add

iv. Fill in the values where A, B and C are located. Then use a similar strategy to complete the area model. What does $\frac{2x^3-3x^2-18x-8}{x-4} = 2x^2+5x+2$?

	$2x^2$	$5x$	2	
x	$2x^3$	$5x^2$	$2x$	
-4	$-8x^2$	$-20x$	-8	

2. Practice (watch Polynomial Division if needed).

Use an area model to divide each expression below:

a. $\frac{x^3+2x^2-13x+10}{x-1}$

	x^2	$3x$	-10
x	x^3	$3x^2$	$-10x$
-1	$-x^2$	$-3x$	10

$x^2 + 3x - 10$

b. $\frac{4x^4+16x^3+13x^2-5x-3}{2x+3}$

	$2x^3$	$5x^2$	$-x$	-1
$2x$	$4x^4$	$10x^3$	$-2x^2$	$-2x$
3	$6x^3$	$15x^2$	$-3x$	-3

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

c. $\frac{3x^4-4x^3-3x^2+19x-20}{3x-4}$

	x^3	$0x^2$	$-1x$	5
$3x$	$3x^4$	$0x^3$	$-3x^2$	$15x$
-4	$-4x^3$	$0x^2$	$4x$	-20

~~$3x^3 - 4x^2 + 4x - 20$~~
 $x^3 - x + 5$

d. $\frac{x^3-1}{x-1}$

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

$x^2 + x + 1$

e. $\frac{x^4+3x^3-2x^2-9x-5}{x^2+2x+1}$

	x^2	x	-5
x^2	x^4	x^3	$-5x^2$
$2x$	$2x^3$	$2x^2$	$-10x$
1	x^2	x	-5

$x^2 + x - 5$

f. $\frac{x^4-2x^2-x-60}{x-3}$

	x^3	$+3x^2$	$+11x$	$+32$	R
x	x^4	$3x^3$	$11x^2$	$32x$	36
-3	$-3x^3$	$-9x^2$	$-33x$	-96	

$x^3 + 3x^2 + 11x + 32 + \frac{36}{x-3}$

↑
Remainder