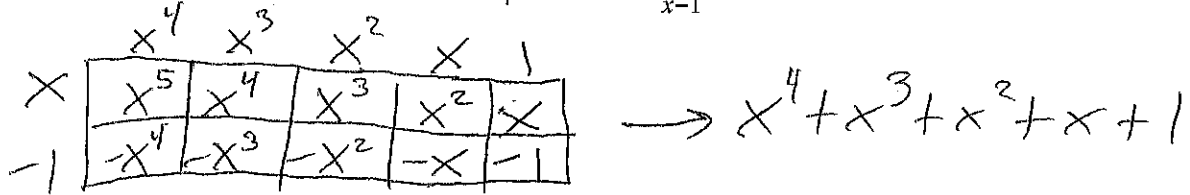


1. a. Use a reverse area model to find the quotient of $\frac{x^5-1}{x-1}$?



- b. Use your answer to (a) to hypothesize the quotient of $\frac{x^{10}-1}{x-1}$?

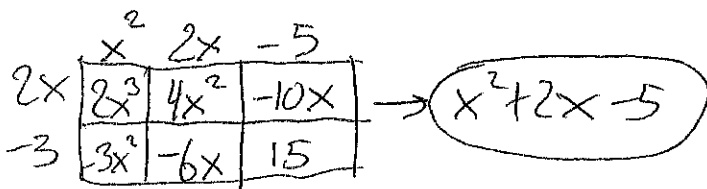
$$x^9 + x^8 + x^7 + \dots + x + 1$$

- c. Generalize the quotient of $\frac{x^n-1}{x-1}$, $n > 1$.

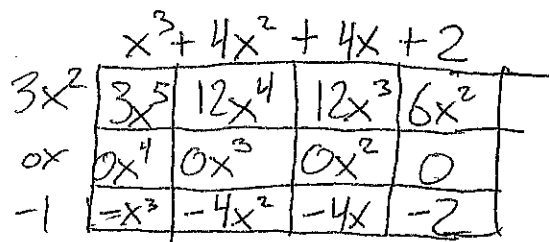
$$x^{n-1} + x^{n-2} + \dots + x + 1$$

2. Use the reverse area model method to solve these division problems.

a. $\frac{2x^3+x^2-16x+15}{2x-3}$

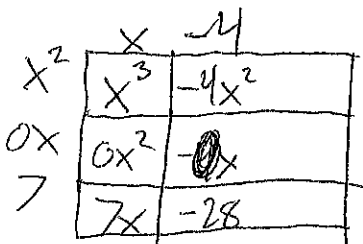


b. $\frac{3x^5+12x^4+11x^3+2x^2-4x-2}{3x^2-1}$

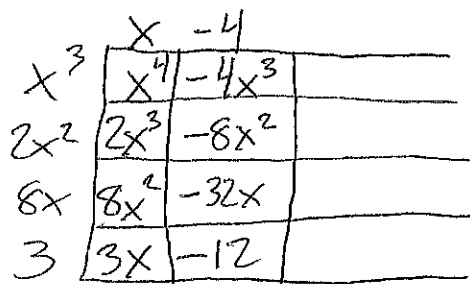


$x^3 + 4x^2 + 4x + 2$

c. $\frac{x^3-4x^2+7x-28}{x^2+7} = x-4$



d. $\frac{x^4-2x^3-29x-12}{x^3+2x^2+8x+3} = x-4$



e. $\frac{6x^5+4x^4-6x^3+14x^2-8}{6x+4}$ Doesn't work

	x^4	$0x^3$	$-x^2$	$+3$
$6x$	$6x^5$	$0x^4$	$-6x^3$	$18x$
4	$4x^4$	$0x^3$	$-4x^2$	12

f. $\frac{x^3-8}{x-2} = x^2+2x+4$

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

g. $\frac{x^3+2x^2+2x+1}{x+1} = x^2+x+1$

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

h. $\frac{x^4+2x^3+2x^2+2x+1}{x+1} = x^3+x^2+x+1$

	x^3	x^2	x	1
x	x^4	x^3	x^2	x
$+1$	x^3	x^2	x	1

3. a. TYPO
 Use polynomial division to find a and b so that $x^3 - 2x^2 - 19x + 20 = 0$ is equivalent to $(x-5)(x^2+ax+b) = 0$

Change to $x-5$.

	x^2	$-7x$	$+16$
x	x^3	$-7x^2$	$16x$
$+5$	$5x^2$	$-35x$	8

~~$x^3 - 2x^2 - 19x - 20$~~

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

b. Hence, find all the zeros of $f(x) = x^3 - 2x^2 - 19x - 20$

$(x-5)(x^2+3x-4)$
 $(x-5)(x+4)(x-1) \rightarrow x=5, -4, 1$

4. Given that $(x-1)$ is a factor of $x^3 - x^2 - 9x + 9$. Find all the roots of $y = x^3 - x^2 - 9x + 9$.

	x^2	$0x$	-9
x	x^3	$0x^2$	$-9x$
-1	$-x^2$	$0x$	9

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

5. Consider the following quotients: $\frac{4x^2+8x+3}{2x+1}$ and $\frac{483}{21}$

a. How are these expressions related?

If $x=10$, the first quotient equals the second.

b. Find each quotient.

	$2x$	3
$2x$	$4x^2$	$6x$
1	$2x$	3

$\rightarrow 2x+3$

$\frac{483}{21} = 23$

c. Explain the connection between the quotients.

Equal if $x=10$