

$$57. \quad x=0 \quad x=0$$

$$x=7 \quad x=4$$

$$x^2(x-7)(x-4)=0$$

$$y = a x^2 (x^2 - 11x + 28)$$

$$y = a (x^4 - 11x^3 + 28x^2)$$

$$9 = a (1^4 - 11(1)^3 + 28(1)^2) \quad (1, 9)$$

$$9 = a (1 - 11 + 28)$$

$$\frac{9}{18} = a \frac{18}{18}$$

$$\frac{1}{2} = a$$

$$y = \frac{1}{2} (x^4 - 11x^3 + 28x^2)$$

2.3 Long Division

$$\begin{array}{r} 647\frac{1}{3} \\ 3 \overline{) 1942} \\ \underline{-18} \\ 14 \\ \underline{-12} \\ 22 \\ \underline{-21} \\ 1 \end{array}$$

$$\frac{x^3 + 4x + 6}{x + 2}$$

$$x+2 \overline{) x^3 + 0x^2 + 4x + 6}$$

$$x^2 - 2x + 8 + \frac{-10}{x+2}$$

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

$$\frac{-2x^2}{x}$$

$$-2x$$

$$-2x^2 + 4x$$

$$-(-2x^2 - 4x)$$

$$8x + 6$$

$$-(8x + 16)$$

$$\hline -10$$

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

$$\begin{array}{r}
 x^2 + 2x + 1 \overline{) x^4 - 5x^3 + 2x^2 - 4x + 1} \\
 \underline{-(x^4 + 2x^3 + x^2)} \\
 -7x^3 + x^2 - 4x + 1 \\
 \underline{-(-7x^3 - 14x^2 - 7x)} \\
 15x^2 + 3x + 1 \\
 \underline{-(15x^2 + 30x + 15)} \\
 -27x - 14
 \end{array}$$

$x^2 - 7x + 15 + \frac{-27x - 14}{x^2 + 2x + 1}$

Synthetic Division

$$\frac{3x^3 - 23x^2 - 12x + 32}{x - 8}$$

$$x - 8$$

$$\begin{aligned} x - 8 &= 0 \\ x &= 8 \end{aligned}$$

8	3	-23	-12	32
	↓	24	8	-32
	3	1	-4	0

Multiply: \dots

Coefficient quadratic x^2

Coefficient linear x

Constant

Remainder

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

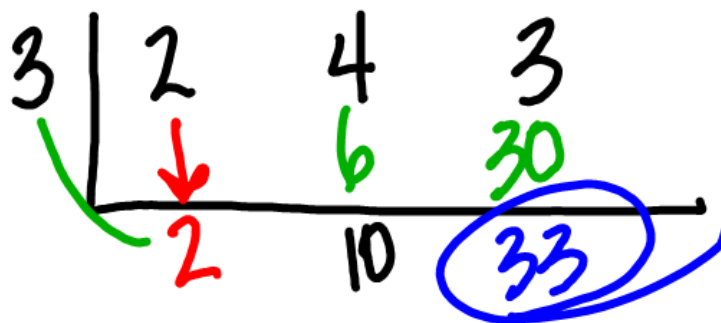
$$\frac{4x^3 + 5x - 1}{x - 2}$$

2	4	0	5	-1
	↓	Add 8	16	42
	4	8	21	41
	x^2	x	Constant	R

$$4x^2 + 8x + 21 + \frac{41}{x-2}$$

$$f(x) = 2x^2 + 4x + 3$$

$$\begin{aligned} f(3) &= 2(3)^2 + 4(3) + 3 \\ &= 18 + 12 + 3 \\ &= 33 \end{aligned}$$



$$37. f(x) = x^3 - x^2 - 14x + 11$$

$$r=4$$

$$4 \left| \begin{array}{cccc} 1 & -1 & -14 & 11 \\ & 4 & 12 & -8 \\ \hline & 1 & 3 & -2 \\ & x^2 & x & c \end{array} \right. \quad \begin{array}{c} \\ \\ \\ R \end{array}$$

$$x^2 + 3x - 2 + \frac{3}{x-4}$$

$$647\frac{1}{3}$$

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

$$(x-k)(g(x)) + R$$

$$x^3 - x^2 - 14x + 11$$