

099 § 5.7 #s 28-30 Au, 35, 36

(28)

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

$$\begin{array}{r} x + 7 \quad r 13 \\ x - 3 \overline{) x^2 + 4x - 8} \\ \underline{-(x^2 - 3x)} \\ 7x - 8 \\ \underline{-(7x - 21)} \\ 13 \end{array}$$

$$\begin{array}{r} 3 \overline{) 1 \quad 4 \quad -8} \\ \underline{ 3 \quad 21} \\ 1 \quad 7 \quad 13 \\ x^1 \quad 0 \quad r \end{array}$$

Interpret: $\frac{\text{Dividend}}{\text{Divisor}} = \text{Quotient} + \frac{\text{remainder}}{\text{divisor}}$

$$\frac{x^2 + 4x - 8}{x - 3} = \boxed{x + 7 + \frac{13}{x - 3}}$$

Alternate (multiply the above by divisor.)

$$x^2 + 4x - 8 = (x - 3)(x + 7) + 13$$

009 of 5, 7 #s 29, 30, 35, 36

29) $\frac{6x^2 + 7x - 18}{x+2}$

$= 6x - 5 + \frac{2}{x+2}$

$$\begin{array}{r} 6x - 5 \quad r \quad 2 \\ x+2 \overline{) 6x^2 + 7x - 18} \\ \underline{-(6x^2 + 12x)} \\ -5x - 18 \\ \underline{-(-5x - 10)} \\ 2 \end{array}$$

OR $6x^2 + 7x - 18 = (x+2)(6x-5) + 2$

30) $\frac{8x^2 - 26x - 9}{2x - 7}$

$= 4x + 1 - \frac{2}{2x-7}$

$$\begin{array}{r} 4x + 1 \quad r \quad -2 \\ 2x - 7 \overline{) 8x^2 - 26x - 9} \\ \underline{-(8x^2 - 28x)} \\ 2x - 9 \\ \underline{-(2x - 7)} \\ -2 \end{array}$$

Synthetic is trickier, because of the "2" ;

$$\frac{8x^2 - 26x - 9}{2x - 7} = \frac{8x^2 - 26x - 9}{2(x - \frac{7}{2})} = \frac{\frac{1}{2}(8x^2 - 26x - 9)}{x - \frac{7}{2}}$$

$$= \frac{4x^2 - 13x - \frac{9}{2}}{x - \frac{7}{2}}$$

$$\begin{array}{r} 4 \quad -13 \quad -\frac{9}{2} \\ \frac{7}{2} \overline{) 4 \quad -13 \quad -\frac{9}{2}} \\ 14 \quad \frac{7}{2} \\ \hline 4 \quad 1 \quad -\frac{2}{2} = -1 \end{array}$$

So $8x^2 - 26x - 9$

$= 2(4x^2 - 13x - \frac{9}{2})$

$= 2(x - \frac{7}{2})(4x + 1) + 2(-1)$

$= (2x - 7)(4x + 1) - 2$

099 § 5.7 #5 35-6

$$\textcircled{35} \quad \frac{2x^3 - 9x^2 + 11x - 6}{2x^2 - 3x + 2} = \boxed{x - 3}$$

$$\begin{array}{r} x-3 \cdot 0 \\ 2x^2-3x+2 \overline{) 2x^3-9x^2+11x-6} \\ \underline{-(2x^3-3x^2+2x)} \\ -6x^2+9x-6 \\ \underline{-(-6x^2+9x-6)} \\ 0 \end{array}$$

$$2x^3 - 9x^2 + 11x - 6 = (x-3)(2x^2 - 3x + 2)$$

$$\textcircled{36} \quad \frac{6x^3 + 7x^2 - x + 3}{3x^2 - x + 1} = 2x + 3$$

$$\begin{array}{r} 2x+3 \\ 3x^2-x+1 \overline{) 6x^3+7x^2-x+3} \\ \underline{-(6x^3-2x^2+2x)} \\ 9x^2-3x+3 \\ \underline{-(9x^2-3x+3)} \\ 0 \end{array}$$

$$6x^3 + 7x^2 - x + 3 = (2x+3)(3x^2 - x + 1)$$