3.3
p251

(9) $P(x) = x^2 + 4x - 8 \qquad D(x) = x + 3$

$$x + 1 - \frac{11}{x+3} = \frac{x^2 + 4x - 8}{x+3}$$

$$x+3 \;\overline{)\; x^2 + 4x - 8}$$

$$-(x^2 + 3x) \qquad = x$$

$$x - 8$$

$$-(x + 3)$$

$$-11$$

$$x^2 \quad x \quad x^0$$

$$-3 \;|\; 1 \quad 4 \quad -8$$

$$\quad\;\; -3 \quad -3$$

$$1 \quad 1 \quad -11 \qquad = \boxed{x^2 + x - \frac{11}{x+3}}$$

3.3
p251

(10) $P(x) = x^3 + 6x + 5 \qquad D(x) = x - 4$

$$x - 4 \overline{)\, x^3 + 0x^2 + 6x + 5}$$

$$x^2 + 4x + 22 + \frac{93}{x-4}$$

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

$$4x^2 + 6x$$

$$-(4x^2 - 16x)$$

$$22x + 5$$

$$-(22x - 88)$$

$$93$$

$$\begin{array}{c|cccc} 4 & 1 & 0 & 6 & 5 \\ & & 4 & 16 & 88 \\ \hline & 1 & 4 & 22 & 93 \end{array}$$

$$x^2 + 4x + 22 + \frac{93}{x-4}$$

3.3 p252

#45

$P(x) = 5x^4 + 30x^3 - 40x^2 + 36x + 14$, $c = -7$

$x - c =$
$x - (-7) = x + 7$

$$\begin{array}{r|rrrrr} -7 & 5 & 30 & -40 & 36 & 14 \\ & & -35 & 35 & 35 & -497 \\ \hline & 5 & -5 & -5 & 71 & -483 \end{array}$$

hence,

$\boxed{P(-7) = -483}$

63

$n = 3$ needs a $3x^2$

$1, -2, 3$

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

$= x^3 + x^2 - 2x$
$\quad -3x^2 - 3x + 6$

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

$-2a = 3$
$a = -\frac{3}{2}$ $\Rightarrow$

$-\frac{3}{2}\left[x^3 - 2x^2 - 5x + 6\right]$

$= \boxed{-\frac{3}{2}x^3 + 3x^2 + \frac{15}{2}x - 9}$