Section 3.3

12.

$$2x+1 \overline{)\,4x^3+0x^2+7x+9}$$

$2x^2 - x + 4$ ← quotient

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

$$-2x^2 + 7x + 9$$

$$+2x^2 + x$$

$$8x + 9$$

$$-8x - 4$$

5 ← remainder

$$\frac{4x^3+7x+9}{2x+1} = 2x^2 - x + 4 + \frac{5}{2x+1}$$

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(58) $P(x) = x^3 - 5x^2 - 2x + 10$

$P(5) = 125 - 125 - 10 + 10 = 0$

Therefore $x-5$ divides $P(x)$ evenly.

$$x-5 \overline{)\,x^3 - 5x^2 - 2x + 10}$$

$x^2 - 2$

$$-(x^3 - 5x^2)$$

$$-2x + 10$$

$$-(-2x + 10)$$

0

Thus $P(x) = x^3 - 5x^2 - 2x + 10 = (x-5)(x^2-2) = (x-5)(x+\sqrt{2})(x-\sqrt{2})$

roots $5, -\sqrt{2}, +\sqrt{2}$