Long Division of Polynomials - Notes

Divide, using long division. After writing your answer use the Remainder Theorem to state whether the binomial is a factor of the polynomial.

1) $(3k^4 - 12k^3 + 7k - 31) \div (k - 4)$

$$3k^3 \qquad + 7$$

$$k-4 \,\overline{)\, 3k^4 - 12k^3 + 0k^2 + 7k - 31}$$

$$-(3k^4 - 12k^3)$$

$$0 \quad 0 \quad 7k - 31$$

$$-(7k - 28)$$

$$-3/k-4$$

$$\boxed{3k^3 + 7 - \frac{3}{k-4}}$$

2) $(16n^4 - 48n^3 - 28n^2 - 4) \div (8n + 4)$

$$2n^3 - 7n^2$$

$$8n+4 \,\overline{)\, 16n^4 - 48n^3 - 28n^2 + 0k - 4}$$

$$-(16n^4 + 8n^3)$$

$$-56n^3 - 28n^2$$

$$-(-56n^3 - 28n^2)$$

$$0 \quad 0 \quad -4/8n+4$$

$$\boxed{2n^3 - 7n^2 - \frac{1}{2n+1}}$$