POYNOMIAL – Long Division

Carry out the following long divisions and express your result as a transformation equation.

1. $x-3\overline{)x^3-2x^2-9x+18}$

2. $x-5\overline{)x^4-3x^3-14x^2+12x+40}$

3. $x^2+x-2\overline{)x^4+x^3-11x^2-9x+18}$

4. $x^2-4\overline{)x^4-3x^3-14x^2+12x+40}$

5. Using your result in qu. 4, factorise completely the polynomial:
$P(x)=x^4-3x^3-14x^2+12x+40$

6. Use the factor theorem to factorise the polynomial: $P(x)=x^4-2x^3-13x^2+14x+24$

ANSWERS:
1. x^2-x+6 & $x^3-2x^2-9x+18=(x-2).(x^2-x+6)$
2. x^3+2x^2-4x-8 & $x^4-3x^3-14x^2+12x+40=(x-5).(x^3+2x^2-4x-8))$
3. x^2-9 & $x^4+x^3-11x^2-9x+18=(x^2+x-2).(x^2-9)$
4. $x^2-3x-10$ & $x^4-3x^3-14x^2+12x+40=(x^2-4).(x^2-3x-10)$
5. $P(x)=(x-2).(x+2)^2.(x-5)$
6. $P(x)=(x+1).(x-2).(x+3).(x-4)$