21. If $(x-2)^2$ is a factor of x^3+px+q, find the value of p and the value of q.

$(a+b)^2 = a^2+2ab+b^2$ $\Rightarrow$ $(x-2)^2 = x^2-4x+4$

divide remainder = 0

$$x^2-4x+4 \overline{)\,x^3+0x^2+px+q}$$

$$x+4$$

$$-x^3 \pm 4x^2 \mp 4x$$

$$4x^2+(p-4)x+q$$

$$-4x^2 \pm 16x \mp 16$$

$$0x + 0$$

equate coefficients

① $(p-4)+16=0$

$p+12=0$

$p=-12$

② $q-16=0$

$q=16$