Synthetic Division of Polynomials

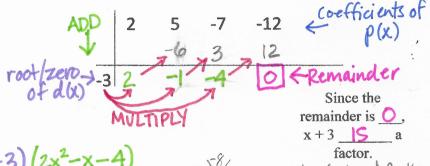
Recall the division algorithm: $\frac{P(x)}{d(x)} = q(x) + \frac{P(x)}{d(x)}$

There is a short cut for division, called Synthetic Division. However, it only works when your divisor is a linear factor in the form x - k.

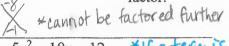
Determine $\frac{P(x)}{d(x)}$. If d(x) is not a factor express your answer using the division algorithm. If d(x) is a factor, then rewrite P(x) in completely factored form.

1.
$$P(x) = 2x^3 + 5x^2 - 7x - 12$$

& $d(x) = x + 3$

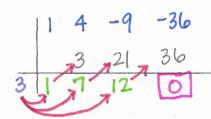


$$p(x) = (x+3)(2x^2-x-4)$$



2.
$$P(x) = x^3 + 4x^2 - 9x - 36$$

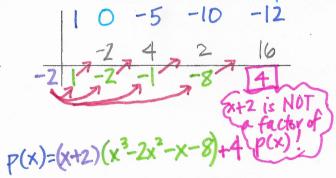
& $d(x) = x - 3$



$$p(x)=(x-3)(x^2+7x+12)$$

$$p(x)=(x-3)(x+3)(x+4)$$

3.
$$P(x) = x^4 - 5x^2 - 10x - 12$$
 *If a term is & $d(x) = x + 2$ MISSING, USE a Remember to put in _____ for missing terms. placehold



* If possible, FACTOR COMPLETELY!