

(b) (1 point) Use your answer from part (a) to factor $2x^3 + x^2 - 11x - 10$ completely.

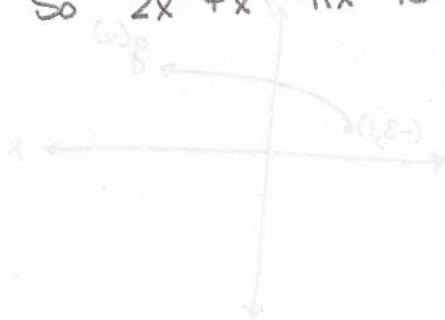
$$2x^2 - x - 10 = 0$$

$$2x^2 + 4x - 5x - 10 = 0$$

$$2x(x+2) - 5(x+2) = 0$$

$$(2x-5)(x+2) = 0$$

So $2x^3 + x^2 - 11x - 10 = (x+1)(2x-5)(x+2)$



2. (3 points) Identify the vertex and axis of symmetry of the quadratic function $f(x) = 3x^2 - 2x + 11$.

Vertex = $(h, k) = (1, 8)$
 Axis of symmetry: $x = 1$

$= 3(x-1)^2 + 8$
 $= 3(x^2 - 2x + 1) + 11$
 $= 3x^2 - 2x + 1 + 11$
 $= 3x^2 - 2x + 11$

3. (a) (2 points) Factor the following division. You may use long division or synthetic division.

$$\frac{2x^2 + x^2 - 11x - 10}{x+1}$$

$$\begin{array}{r|rrrr} -1 & 2 & 1 & -11 & -10 \\ & & -2 & 1 & 10 \\ \hline & 2 & -1 & -10 & 0 \end{array}$$

$$2x^2 - x - 10$$

$$\begin{array}{r} x+1 \overline{) 2x^2 + x^2 - 11x - 10} \\ \underline{2x^2 + 2x} \\ -x^2 - 11x - 10 \\ \underline{-x^2 - 11x} \\ -10x - 10 \\ \underline{-10x - 10} \\ 0 \end{array}$$