

(b) (1 point) Use your answer from part (a) to factor  $2x^3 - 13x^2 + 17x + 12$  completely.

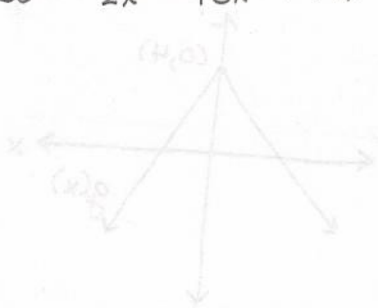
$$2x^2 - 5x - 3 =$$

$$2x^2 - 6x + x - 3 =$$

$$2x(x-3) + (x-3) =$$

$$(2x+1)(x-3)$$

So  $2x^3 - 13x^2 + 17x + 12 = (x-4)(2x+1)(x-3)$ ,



2 (3 points) Identify the vertex and axis of symmetry of the quadratic function  $f(x) = -2x^2 + 8x - 8$ .

Vertex =  $(2, 0)$   
 Axis of symmetry:  $x = 2$

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

$$\frac{2x^3 - 13x^2 + 17x + 12}{x - 4}$$

$$\begin{array}{r} 2x^2 - 5x - 3 \\ 4 \overline{) 2x^3 - 13x^2 + 17x + 12} \\ \underline{8x^2 - 20x - 12} \phantom{+ 12} \\ 8x^2 - 20x - 12 \\ \underline{8x^2 - 20x - 12} \\ 0 \end{array}$$

OR

$$\begin{array}{r} 2x^2 - 5x - 3 \\ x - 4 \overline{) 2x^3 - 13x^2 + 17x + 12} \\ \underline{2x^3 - 8x^2 - 8x - 12} \\ -5x^2 + 25x + 24 \\ \underline{-5x^2 + 20x + 20} \\ 5x + 4 \\ \underline{5x - 20} \\ 24 \end{array}$$