

NAME _____

Quiz 6

Calculators are not allowed. Write your answers on the dashed lines.

[50] Question 1: Given the quadratic function $f(x) = 2(x+2)^2 + 4$:

[10] • Calculate the discriminant

$$f(x) = 2(x^2 + 4x + 4) + 4 = 2x^2 + 8x + 12 \quad [5]$$

$$D = 8^2 - 4(2)(12) = 64 - 96 = -32 \quad [5]$$

[5] • Find the y -intercept

$$f(0) = 12$$

[5] • Find the x -intercepts if they exist

Don't exist

Note: for this question if there is an error in first step but everything else is correct \rightarrow give credit

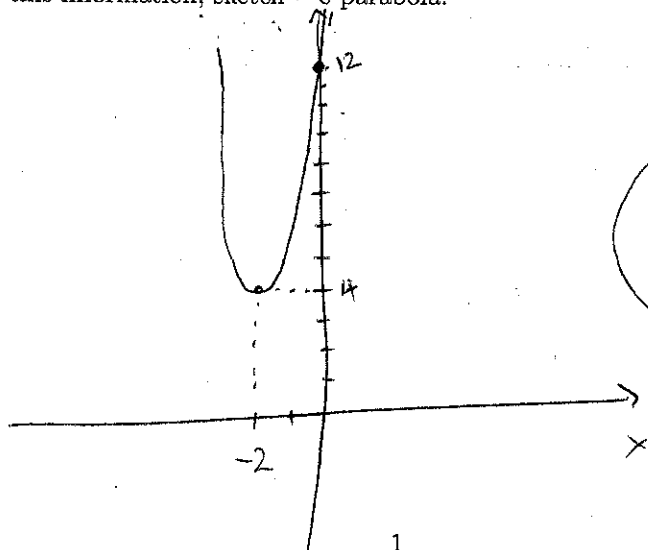
NP [5] • Complete the square if necessary

not necessary

[10] • Deduce the position of the vertex: $\text{-----} (-2, 4) \text{-----} ([-5] \text{ if sign wrong})$.

NP [5] • Does this parabola open up or down? $\text{-----} \uparrow \text{-----}$

[10] • Based on all this information, sketch the parabola.



[2] for each discrepancy with what they found above

[50] Question 2: Given the quadratic function $f(x) = 2x^2 + 3x - 2$:

N.P. [5] • Calculate the discriminant: $D = b^2 - 4ac$

$$D = 3^2 - 4(2)(-2) = 9 + 16 = 25$$

N.P. [5] • Find the y-intercept

$$f(0) = -2$$

[10] • Find the x-intercepts if they exist

$$\text{Use } x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$$

$$x_{1,2} = \frac{-3 \pm \sqrt{25}}{2(2)}$$

$$= \frac{-3 \pm 5}{4} = \begin{cases} -2 & [5] \\ 1/2 & [5] \end{cases}$$

(-2/ algebra error)

-3/ algebra error

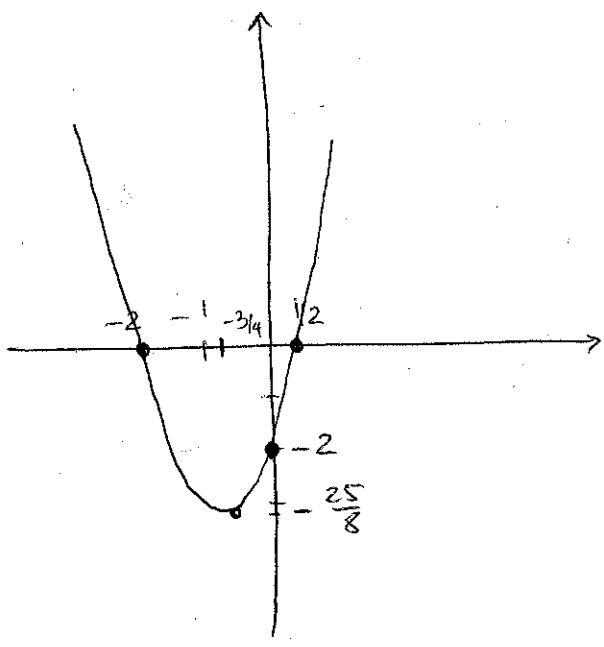
[10] • Complete the square if necessary

$$2x^2 + 3x - 2 = 2(x^2 + \frac{3}{2}x - 1) = 2[x^2 + 2 \cdot \frac{3}{4}x + (\frac{3}{4})^2 - (\frac{3}{4})^2 - 1] = 2[(x + \frac{3}{4})^2 - \frac{9}{16} - 1] = 2(x + \frac{3}{4})^2 - \frac{9}{8} - 2 = 2(x + \frac{3}{4})^2 - \frac{25}{8}$$

[5] • Deduce the position of the vertex: $(-\frac{3}{4}, -\frac{25}{8}) \rightarrow$ (must be consistent with above, -2 for sign error)

N.P. [5] • Does this parabola open up or down? up

[10] • Based on all this information, sketch the parabola.



Note:
 $\frac{25}{8} = \frac{24}{8} + \frac{1}{8}$
 $= 3 + \frac{1}{8} = 3.125$

[2] for each discrepancy with what they found above