The question may ask for the focus or directrix of a quadratic, given its equation.

What is the equation of the directrix for the parabola $-8(y - 3) = (x + 4)^2$?
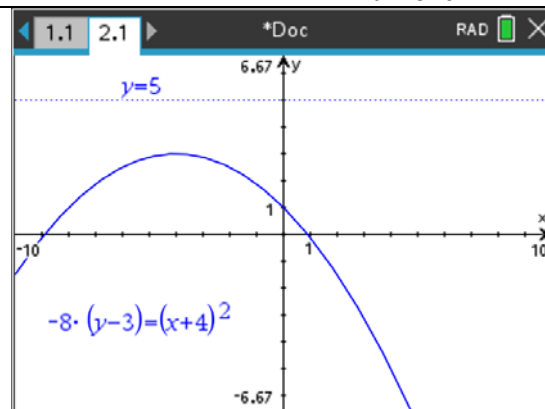
(1) $y = 5$ (3) $y = -2$

(2) $y = 1$ (4) $y = -6$

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Add a Graphs page and enter the equation.

Menu: 6, 8, 5 and click on the parabola to find the directrix.

(1) is the correct response.

If this were an open ended question, algebraic work similar to this is required for full credit:

In vertex form, the parabola is $y = -\dfrac{1}{4(2)}(x+4)^2 + 3$. The vertex is $(-4, 3)$ and $p = 2$. $3 + 2 = 5$

The question may ask for the equation of the quadratic, given its focus and directrix explicitly or graphically.

Which equation represents a parabola with a focus of $(-2, 5)$ and a directrix of $y = 9$?

(1) $(y - 7)^2 = 8(x + 2)$

(2) $(y - 7)^2 = -8(x + 2)$

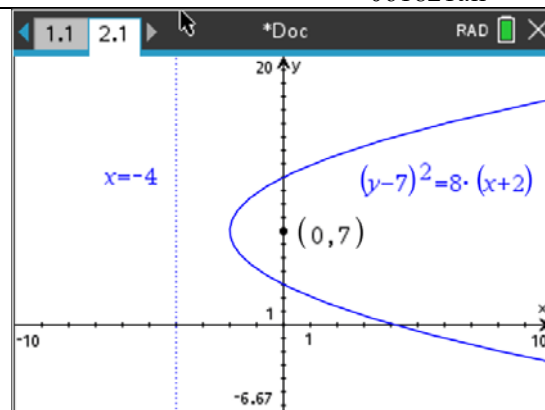(3) $(x + 2)^2 = 8(y - 7)$

(4) $(x + 2)^2 = -8(y - 7)$

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Add a Graphs page and enter the equation in choice (1).

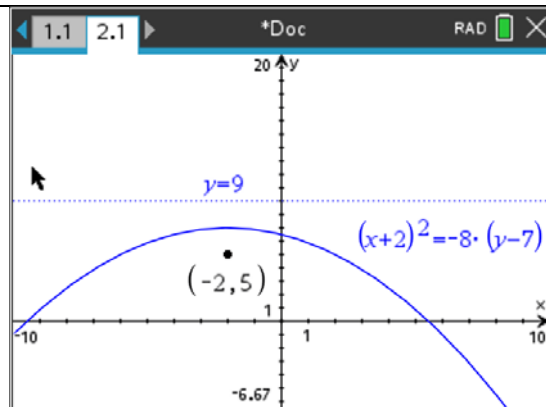Menu: 6, 8, 5 and click on the parabola to find the directrix.

Menu: 6, 8, 3 and click on the parabola to find the focus.

The directrix and focus are wrong.

Edit the equation to choices (2)-(4) until the directrix and focus are right. (4) is the correct response.	

If this were an open ended question, algebraic work similar to this is required for full credit:

$$\frac{5+9}{2} = 7, \text{ vertex: } (-2,7); \; p = 7-9 = -2, \; y = \frac{1}{4(-2)}(x+2)^2 + 7$$

$$y - 7 = \frac{1}{-8}(x+2)^2$$

$$-8(y-7) = (x+2)^2$$

If the question does not have equations, an algebraic or graphical approach may help.

A parabola has a directrix of $y = 3$ and a vertex at $(2,1)$. Which ordered pair is the focus of the parabola?

(1) $(2,-1)$ (3) $(2,2)$

(2) $(2,0)$ (4) $(2,5)$ 062213aii

The vertical distance from the directrix to the vertex, p, is 2. The vertical distance from the vertex to the focus is also 2. Since the directrix is above the vertex, the focus is below the vertex. $1 - 2 = -1$.
(1) is the correct response.

For more questions, go to https://www.jmap.org/htmlstandard/G.GPE.A.2.htm.