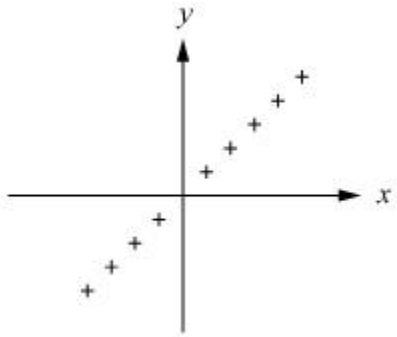
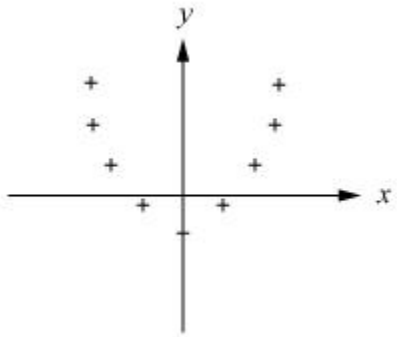
Question: Please choose the answer that best matches the question asked.

Samuel collected data during an experiment for Physics class. He then plotted his data in a scatterplot in the standard (x,y) coordinate grid, using a + sign to represent each data point. He found that for each data point, the value of the y-coordinate was two more than the square of the value of the x-coordinate. Which one of the following graphs, all of which have equal scales on their axes, could show the data points Samuel collected?

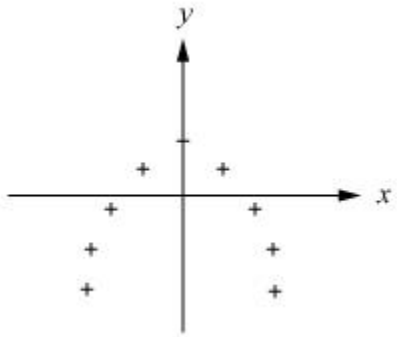
A



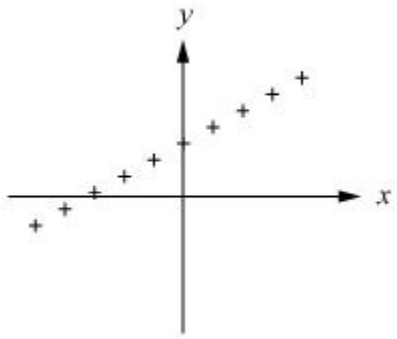
B



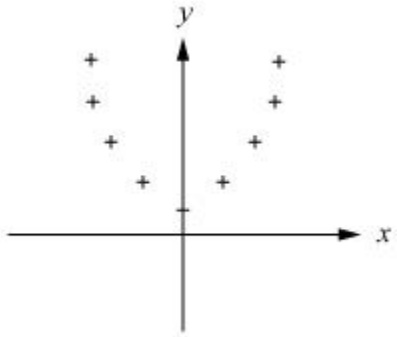
C



D



E



Explanation

ACT instructor
Stephanie

We need to find the graph for which each y-coordinate is two more than the square of each x-coordinate. In other words, for any x, we have to **square x, then add 2 to get y**. So, we're looking for the graph of the equation $\mathbf{y=x^2+2}$.

So which of these graphs could be $y=x^2+2$? Let's look each of the terms in the equation to see what we're looking for.

Let's start with the x^2. The fact that there's an x^2 means we're looking for a *parabola*. So we can eliminate A and D, which are lines.
Furthermore, the x^2 is **positive**, which means the parabola will *open upwards*. So we can eliminate C, which opens downwards (and would only be correct if we had a $-x^2$ instead).
Now we're left with B and E. The final term is the 2 in the equation. The constant term for parabolas is the **y-intercept**. In this case, it means the parabola should go through positive 2 on the y-axis.
Well, our axes don't have numbers, so we don't know exactly where they cross. So we'll have to be a little more creative. It looks like B goes through

a *negative* number on the y-axis, which means it can't possibly be positive 2. That means the answer must be E! And if we check, E does seem to go through a positive number, so we must be right.