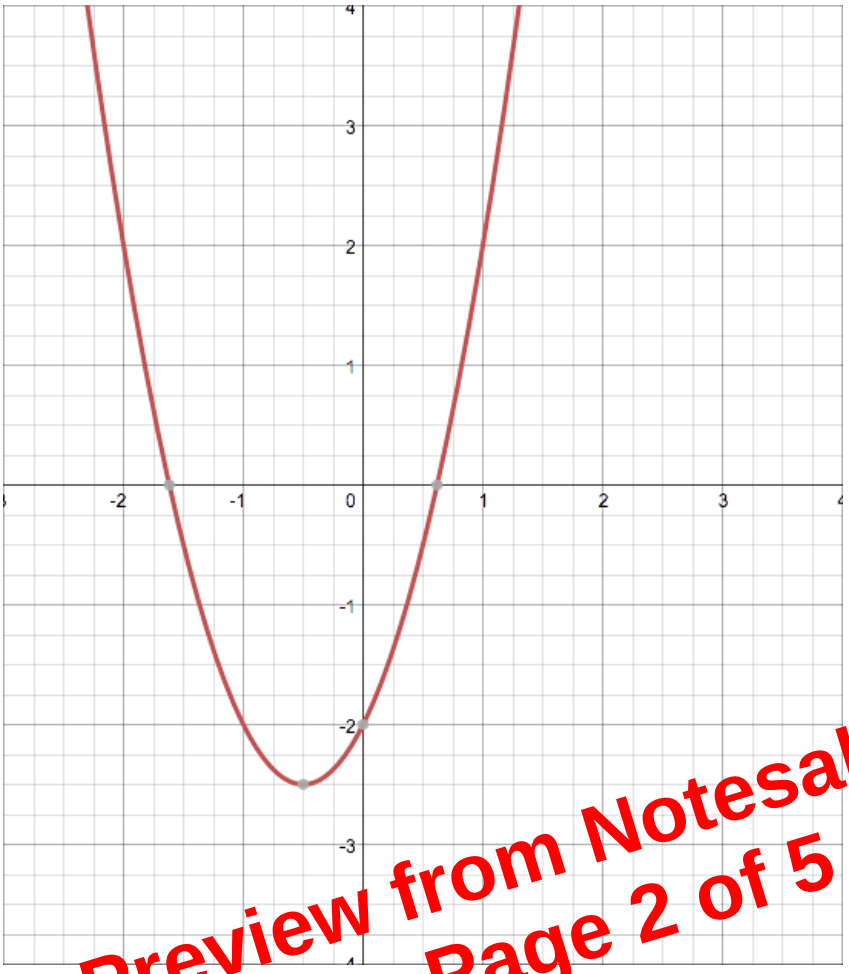

Unfortunately, we can't deduce as much from this equation just by looking at it. For starters, the gradient is constantly changing, so there wouldn't be a single value for it anyway. What we can do however, is find the gradient at any given point on the curve. This is where the differentiation comes in. We can calculate what is called a "derivative" of our graph's equation. The notation for this is given as dY/dX=

This means "The derivative of Y with respect to X" and to calculate it, for each term, we multiply the coefficient of X by the power of X and then subtract 1 from each power. Here is our example, $Y=2X^2+2X-2$. We must remember that 2X is the same as $2X^1$ and that -2 can be written as $2X^0$.

So let's multiply the powers of X by the coefficients of X, leaving $4X^2+2X^1-0X^0$.

Now we must subtract 1 from our powers to give us $4X^1+2X^0-0X^{-1}$.

This simplifies to 4X+2. What we might notice here is that any term where the power of X is 1, we can just throw away the X because the coefficient is unchanged, and any constant, like our –2, can also be thrown away. And there we have it.

$Y=2X^2+2X-2$ therefore we can calculate that dY/dX=4X+2.