8 things you can do to revise

Equations of Curves

Getting Started

For these tasks you'll need to pick a random equation involving x and y, or try trading equations with a friend. This poster will use the example $yx+3x^2=x^3-4x$, don't get scared off quite yet!

You might not be able to do all of these things with your equation, but give them a go anyway!

1. Simplify

Cancel any common factors and make as simple as possible.

$$yx+3x^2=x^3-4x$$
$$x(y+3x)=x(x^2-4)$$
$$y+3x=x^2-4$$

2. Make y the Subject

Meaning rearrange so y is on its own.

$$y+3x=x^2-4$$
$$y=x^2-3x-4$$

3. Find Root(s) (if they exist!)

Roots of an equation are where $y=0$.

$$0=x^2-3x-4$$
$$0=(x-4)(x+1)$$
$$0=(x-4) \text{ or } 0=(x+1)$$
$$x=4 \text{ or } -1$$

4. Differentiate

Which rules do you know?

$$\frac{dy}{dx}=\frac{d}{dx}(x^2-3x-4)=2x-3$$

5. Find Stationary Point(s)

Stationary points are where $\frac{dy}{dx}=0$.

$$0=2x-3 \quad so \quad x=3/2$$
$$y=(3/2)^2-3(3/2)-4=-25/4$$

Turning point is at $(3/2\ ,\ -25/4)$

6. Differentiate (again!)

$$\frac{d^2y}{dx^2}=\frac{d}{dx}\left(\frac{dy}{dx}\right)=\frac{d}{dx}(2x-3)=2$$

7. Classify Stationary Point(s)

$\frac{d^2y}{dx^2}=2>0$ so the turning point is a minimum.

8. Sketch!

Use the information you gathered above to make a nice labelled sketch. Include intercepts of both axes, coordinates of turning points and the general shape.

Don't know what shape your curves is? It might help to think what happens to y when x is really large or really close to 0.