POWER RULE

The Power Rule is used to differentiate terms and is a fundamental process involved in other rules of differentiation, like the quotient and product rule. The Power Rule is always applied to a term in this process.

$$f'(x^n) = nx^{n-1}$$
$$f(x) = x^4$$

DIFFERENTIATE x^4

The exponent is simply brought to the position of the co-efficient and one is subtracted from the exponent.

$$f'(x) = 4x^3$$

Here is another example with fractional and surd values, the same process is applied

Note that $(7/2) - 1$ is $5/2$

$$f(x) = x^{\frac{7}{2}}$$
$$\therefore f'(x) = \frac{7}{2} x^{\frac{5}{2}}$$

$$f(x) = x^{\sqrt{2}}$$
$$\therefore f'(x) = \sqrt{2} x^{\sqrt{2}-1}$$

The formula is based on where n is some value and x is the pronumeral or input value for a function.

It is quite simple, it is just a matter of moving a value and subtracting. Be careful to subtract fractions correctly though. Simplify surds were possible for easier calculations in multiple part questions. Sometimes, you may need to leave it in sqrt(2) -1 form to have the most elegant solution, this is what I have done above.