

21st January



Corbettmaths

Express as a single fraction.

$$\frac{1}{x+1} + \frac{4}{x-2}$$

$$\frac{x-2}{(x+1)(x-2)} + \frac{4x+4}{(x+1)(x-2)}$$

$$\frac{5x+2}{(x+1)(x-2)}$$

Salary (£1000s)	Frequency
$0 < s \leq 10$	8
$10 < s \leq 20$	48
$20 < s \leq 30$	50 *
$30 < s \leq 50$	11
$50 < s \leq 200$	3

120

60<sup>th</sup> value

Calculate an estimate of the median salary

$$20 + \frac{4}{50} \times 10 = 20.8$$

Show the equation

$$x^3 + 3x = 1$$

has a solution between  $x=0$  and  $x=1$ 

$$f(x) = x^3 + 3x - 1$$

$$f(0) = -1 \quad f(1) = 3$$

Since there is a change of sign between  $x=0$  &  $x=1$ , there must be a solution.

Show the equation

$$x^3 + 3x = 1$$

can be rearranged to give

$$x = \frac{1}{3} - \frac{x^3}{3}$$

$$3x = 1 - x^3$$

$$x = \frac{1}{3} - \frac{x^3}{3}$$

Starting with  $x_1 = 0$ 

use the iteration formula

$$x_{n+1} = \frac{1}{3} - \frac{(x_n)^3}{3}$$

three times to find a solution to

$$x^3 + 3x = 1$$

$$x_1 = 0$$

$$x_2 = \frac{1}{3} - \frac{0^3}{3} = \frac{1}{3}$$

$$x_3 = \frac{1}{3} - \frac{(\frac{1}{3})^3}{3} = 0.320987\dots$$

$$x_4 = \frac{1}{3} - \frac{(0.320987)^3}{3} = 0.3223092184$$