



The equation of a circle is $x^2 + y^2 = 49$ $r = 7$

Find the circumference of the circle.
Give your answer to 2 decimal places.

$$C = \pi \times 14$$

$$= 43.98229\dots$$

$$= 43.98 \text{ to 2 dp.}$$

Work out an expression for the n th term of this quadratic sequence

3 14 31 54 ...
 11 6 17 6 23

Give your answer in the form $an^2 + bn + c$

$$a = 3$$

$$b = 2$$

$$c = -2$$

$$3n^2 + 2n - 2$$

Show the equation $2x^3 + 9x = 40$ has a solution between 2 and 3.

let $f(x) = 2x^3 + 9x - 40$

$f(2) = -6$

$f(3) = 41$

since there is a change of sign, there is a solution between 2 and 3.

Show that $2x^3 + 9x = 40$ can be arranged to give

$$x = \sqrt[3]{20 - \frac{9}{2}x}$$

$$2x^3 = 40 - 9x$$

$$x^3 = 20 - \frac{9}{2}x$$

$$x = \sqrt[3]{20 - \frac{9}{2}x}$$

Starting with $x_0 = 2$, use the iteration formula

$$x_{n+1} = \sqrt[3]{20 - \frac{9}{2}x_n}$$

to find an estimate to the solution to $2x^3 + 9x = 40$

$$x_0 = 2$$

$$x_1 = 2.22398\dots$$

$$x_2 = 2.1538\dots$$

$$x_3 = 2.17630\dots$$

$$x_4 = 2.16917\dots$$

$$x_5 = 2.17144\dots$$

$$x_6 = 2.1707\dots$$

$2.171 \text{ to } 3 \text{ dp.}$

$$x_7 = 2.17095\dots$$

$$x_8 = 2.17087\dots$$

$$x_9 = 2.1709\dots$$