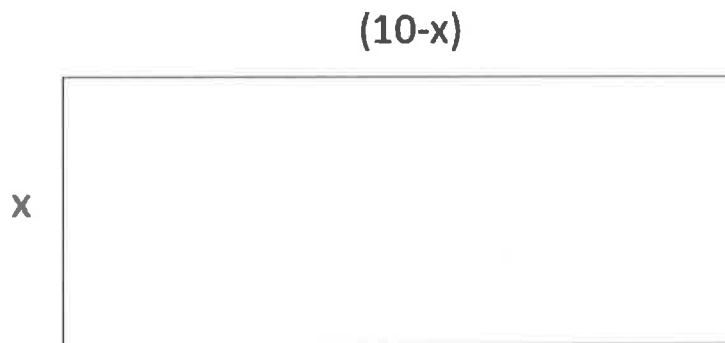


Leaving Cert - Revision Sheet 6

Algebra/Calculus

1. The diagram shows the dimensions of a rectangle.



(a) Write down a formula for A , the area of the rectangle.

(b) Find the value of x which maximises the area of the rectangle

(c) Hence, find the maximum area of the rectangle

2. The formula for the volume of a cylinder is $V = \pi r^2 h$, where r is the radius and h is the height of the cylinder.

(i) Rearrange the formula to make r the subject of the formula

(ii) Hence, find the radius of a cylinder which has Volume of 1320cm and height of 10cm. Give your answer correct to one decimal place.

Patterns / Sequences / Functions

3. The formula for the general term of a quadratic sequence is given by $T_n = 2n^2 + bn + c$

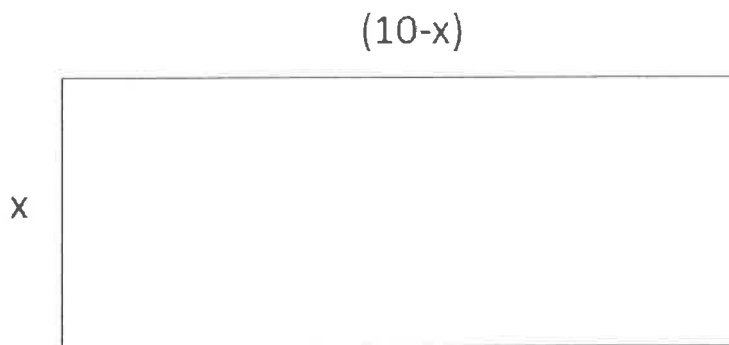
(a) If the 3rd term is 11 and the 5th term is 37, find the values of b and c

(b) Hence, or otherwise, find the 10th Term of the sequence

Leaving Cert - Revision Sheet 6

Algebra/Calculus

1. The diagram shows the dimensions of a rectangle.



(a) Write down a formula for A, the area of the rectangle.

$$A = (10-x)(x)$$

$$A = 10x - x^2$$

(b) Find the value of x which maximises the area of the rectangle

$$\frac{dA}{dx} = 0 \quad \text{THEN SOLVE}$$

$$\frac{dA}{dx} = \frac{10 - 2x}{+2x} = 0$$
$$10 = 2x$$
$$5 = x$$

(c) Hence, find the maximum area of the rectangle

$$A = 10(5) - (5)^2$$
$$= 25$$

↔

2. The formula for the volume of a cylinder is $V = \pi r^2 h$, where r is the radius and h is the height of the cylinder.

(i) Rearrange the formula to make r the subject of the formula

$$\frac{\pi r^2 h}{\pi h} = \frac{V}{\pi h}$$

$$r^2 = \frac{V}{\pi h}$$

$$r = \sqrt{\frac{V}{\pi h}}$$

(ii) Hence, find the radius of a cylinder which has Volume of 1320cm and height of 10cm. Give your answer correct to one decimal place.

$$V = 1320$$

$$h = 10$$

$$r = \sqrt{\frac{V}{\pi h}}$$

$$= \sqrt{\frac{1320}{(\pi)(10)}}$$

$$= \boxed{6.5} \text{ cm}$$

Patterns / Sequences / Functions

3. The formula for the general term of a quadratic sequence is given by $T_n = 2n^2 + bn + c$
 (a) If the 3rd term is 11 and the 5th term is 37, find the values of b and c

$T_3 = 11$ $2(3)^2 + b(3) + c = 11$ $\begin{array}{r} 18 + 3b + c = 11 \\ -18 -18 \end{array}$	$T_5 = 37$ $\begin{array}{r} 2(5)^2 + b(5) + c = 37 \\ \cancel{50} + 5b + c = 37 \\ \cancel{-50} \end{array}$
$\textcircled{1} \quad 3b + c = -7$	$\textcircled{2} \quad 5b + c = -13$
$\begin{array}{r} \times \textcircled{1} \quad -3b + \cancel{c} = -7 \\ \textcircled{2} \quad 5b + \cancel{c} = -13 \\ \hline 2b = -6 \\ \boxed{b = -3} \end{array}$	
$\begin{array}{r} \textcircled{1} \quad \begin{array}{r} -9 + c = -7 \\ +9 +9 \end{array} \\ \hline \boxed{c = 2} \end{array}$	

- (b) Hence, or otherwise, find the 10th Term of the sequence

$$T_n = 2n^2 - 3n + 2$$

$$T_{10} = 2(10)^2 - 3(10) + 2$$

$$= \boxed{172}$$

$T_1 = 2(1)^2 - 3(1) + 2 = 1$	1
$T_2 = 2(2)^2 - 3(2) + 2 = 4$	1 4 11 22 37
$T_3 =$	$\underbrace{\quad\quad}_3 \quad \underbrace{\quad\quad}_7 \quad \underbrace{\quad\quad}_{11} \quad \underbrace{\quad\quad}_{15}$