

MATH II

Review #2

1A. 0, 9, 30, 69, 132, 225

$\begin{array}{cccccc} & \vee & \vee & \vee & \vee & \vee \\ D_1 & 9 & 21 & 39 & 63 & 93 \end{array}$

$\begin{array}{cccc} & \vee & \vee & \vee & \vee \\ D_2 & 12 & 18 & 24 & 30 \end{array}$

$\begin{array}{ccc} & \vee & \vee & \vee \\ D_3 & 6 & 6 & 6 \end{array}$

$D_{\boxed{3}} = \underline{6}$ (Cubic)

$$y = \underline{x^3 + 2x - 3}$$

B. -3, 1, 5, 9, 13, 17

$\begin{array}{ccccc} & \vee & \vee & \vee & \vee & \vee \\ D_1 & 4 & 4 & 4 & 4 & 4 \end{array}$

$D_{\boxed{1}} = \underline{4}$ (linear)

$$y = \underline{4x - 7}$$

C. $20, -7, -56, -103, -100, 25$ $D_{\boxed{4}} = \underline{24}$ (Quartic)

D_1 $-27, -49, -47, 3, 125$

D_2 $-22, 2, 50, 122$

D_3 $24, 48, 72$

D_4 $24, 24$

$y = \underline{x^4 - 6x^3 + 25}$

D. $4, 0, -2, -2, 0, 4$

D_1 $-4, -2, 0, 2, 4$

D_2 $2, 2, 2, 2$

$D_{\boxed{2}} = \underline{2}$ (Quadratic)

$y = \underline{x^2 - 7x + 10}$

2. <u>Years</u>	<u>Salary/week</u>
0	500
1	780
3	1220
5	1500
7	1620
h_1 ↗	h_2 ↗

To find the salary for year 4, use the graphing calculator.

From Calculator: $y = -20x^2 + 300x + 500$

$$\begin{aligned} \text{When } x=4 \quad y &= -20(4)^2 + 300(4) + 500 \\ y &= -20(16) + 1200 + 500 \\ y &= -320 + 1200 + 500 \\ y &= 1380 \end{aligned}$$

D. \$1380

$$3. \begin{array}{|c|} \hline x \\ \hline \end{array} \begin{array}{|c|} \hline (30-2x) \\ \hline \end{array} \begin{array}{|c|} \hline x \\ \hline \end{array}$$

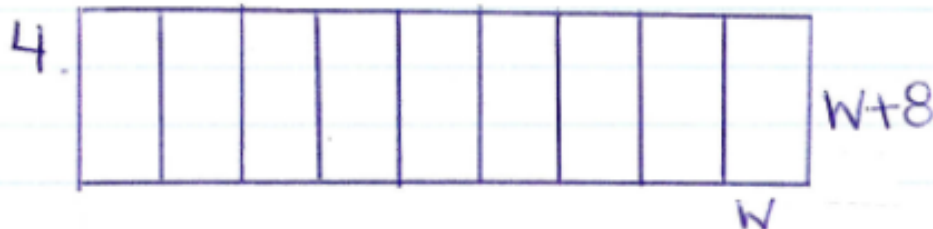
$$P = 30\text{m}$$

let $x = \text{width}$

$$30 - 2x = \text{length}$$

$$A = l \times w$$

$$A = (30 - 2x)(x) \Rightarrow A$$



$$\text{Total Area} = 90\text{m}^2$$

Area of 1 Section

$$= \frac{90\text{m}^2}{9}$$

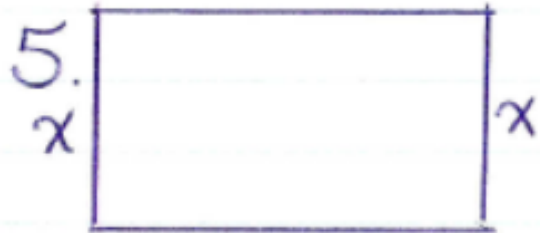
$$= 10\text{m}^2$$

$$A = l \times w$$

$$10\text{m}^2 = (w+8)(w)$$

$$10\text{m}^2 = w^2 + 8w$$

$$0 = w^2 + 8w - 10 \Rightarrow B.$$



$$P = 200\text{m}$$

Let $x = \text{width}$

$$\frac{200 - 2x}{2} = \text{length}$$
$$100 - x = \text{length.}$$

$$A = l \times w$$
$$A = (100 - x)x \Rightarrow A$$

$$6. a) \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$$

$\underbrace{\hspace{1.5cm}}_{\times \frac{1}{2}} \quad \underbrace{\hspace{1.5cm}}_{\times \frac{1}{2}}$

$$t_1 = \frac{1}{2}$$

$$r = \frac{1}{2}$$

$$\Rightarrow t_n = t_1 r^{n-1}$$
$$\Rightarrow t_n = \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)^{n-1}$$

$$\Rightarrow t_8 = \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)^{8-1}$$
$$= \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)^7$$
$$= \left(\frac{1}{2}\right) \left(\frac{1}{128}\right)$$
$$= \frac{1}{256}$$

b) $64, -32, 16, \dots$

$\xrightarrow{x^{-\frac{1}{2}}} \xrightarrow{x^{-\frac{1}{2}}}$

$$t_1 = 64$$

$$r = -\frac{1}{2}$$

$$\begin{aligned} t_n &= t_1 r^{n-1} \\ \Rightarrow t_n &= (64) \left(-\frac{1}{2}\right)^{n-1} \end{aligned}$$

$$\begin{aligned} \Rightarrow t_7 &= (64) \left(-\frac{1}{2}\right)^{7-1} \\ &= (64) \left(-\frac{1}{2}\right)^6 \\ &= (64) \left(\frac{1}{64}\right) \\ &= \frac{64}{64} \\ &= 1 \end{aligned}$$

$$c) 2x, 4x^2, 8x^3, \dots$$

$$t_1 = 2x$$

$$r = 2x$$

$$\begin{aligned} t_n &= t_1 r^{n-1} \\ \Rightarrow t_n &= 2x(2x)^{n-1} \end{aligned}$$

$$\begin{aligned} \Rightarrow t_{10} &= 2x(2x)^{10-1} \\ t_{10} &= 2x(2x)^9 \\ t_{10} &= 2x(512x^9) \\ t_{10} &= 1024x^{10} \end{aligned}$$

7.

a) 4, 12, 36, ..., 972
 $\underbrace{\quad}_{\times 3}$ $\underbrace{\quad}_{\times 3}$

$$t_1 = 4$$

$$r = 3$$

$$t_n = 972$$

$$t_n = t_1 r^{n-1}$$
$$972 = (4)(3)^{n-1}$$

$$\frac{972}{4} = \frac{(4)(3)^{n-1}}{4}$$

$$243 = 3^{n-1}$$

$$(3)^5 = 3^{n-1}$$

$$5 = n-1$$

$$5+1 = n$$

$$6 = n$$

b) 3, 6, 12, ..., 768
 \swarrow \swarrow
 x2 x2

$$t_1 = 3$$

$$r = 2$$

$$t_n = 768$$

$$t_n = t_1 r^{n-1}$$

$$768 = (3)(2)^{n-1}$$

$$\frac{768}{3} = \frac{(3)(2)^{n-1}}{3}$$

$$256 = 2^{n-1}$$

$$(2)^8 = 2^{n-1}$$

$$8 = n-1$$

$$8+1 = n$$

$$9 = n$$

$$c) \frac{1}{25}, \frac{1}{5}, 1, \dots, 625$$

$\underbrace{\quad}_{\times 5} \quad \underbrace{\quad}_{\times 5}$

$$t_1 = \frac{1}{25}$$

$$t_n = t_1 r^{n-1}$$

$$625 = \left(\frac{1}{25}\right) (5)^{n-1}$$

$$r = 5$$

$$625 \div \frac{1}{25} = 5^{n-1}$$

$$t_n = 625$$

$$625 \times \frac{1}{25} = 5^{n-1}$$

$$15625 = 5^{n-1}$$

$$(5)^6 = 5^{n-1}$$

$$6 = n-1$$

$$6+1 = n$$

$$7 = n$$