

MATH II

Review #2

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

D_1 9 21 39 63 93

D_2 12 18 24 30

D_3 6 6 6

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

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

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

D_1 4 4 4 4 4

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

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

C. 20, -7, -56, -103, -100, 25

D_1 -27 -49 -47 3 125

D_2 -22 2 50 122

D_3 24 48 72

D_4 24 24

$D_{\boxed{4}} = \underline{24}$ (Quartic)

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

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. Years	Salary/week
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: $y = -20x^2 + 300x + 500$

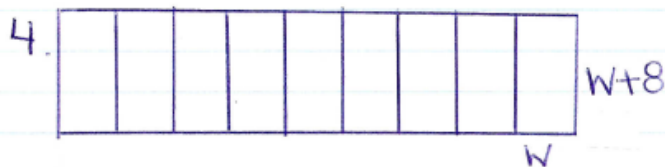
$$\begin{aligned} \text{When } x=4 \quad y &= -20(4)^2 + 300(4) + 500 \\ y &= -20(16) + 1200 + 500 \\ y &= -320 + 1200 + 500 \\ y &= 1380 \end{aligned}$$

D. \$1380

3. $x \mid \underline{(30-2x)} \mid x$

$$\begin{aligned} P &= 30\text{m} \\ \text{let } x &= \text{width} \\ 30-2x &= \text{length} \end{aligned}$$

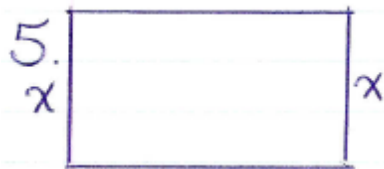
$$\begin{aligned} A &= l \times w \\ A &= (30-2x)(x) \Rightarrow A \end{aligned}$$



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

$$\begin{aligned} \text{Area of 1 Section} &= \frac{90\text{m}^2}{9} \\ &= 10\text{m}^2 \end{aligned}$$

$$\begin{aligned} A &= l \times w \\ 10\text{m}^2 &= (w+8)(w) \\ 10\text{m}^2 &= w^2 + 8w \\ 0 &= w^2 + 8w - 10 \Rightarrow B. \end{aligned}$$



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

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

$\xrightarrow{\times \frac{1}{2}}$ $\xrightarrow{\times \frac{1}{2}}$

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

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

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

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

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

$$= \left(\frac{1}{2}\right) \left(\frac{1}{2}\right)^7$$

$$= \left(\frac{1}{2}\right) \left(\frac{1}{128}\right)$$

$$= \frac{1}{256}$$

b) $64, -32, 16, \dots$
 $\xrightarrow{x^{-\frac{1}{2}}} \xrightarrow{x^{-\frac{1}{2}}}$

$$t_1 = 64$$

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

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

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

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

$$t_1 = 2x$$

$$r = 2x$$

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

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

7.

$$a) 4, 12, 36, \dots, 972$$

$\underbrace{\quad}_{\times 3} \quad \underbrace{\quad}_{\times 3}$

$$t_1 = 4$$

$$r = 3$$

$$t_n = 972$$

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

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

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

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

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

$$5 = n-1$$

$$5+1 = n$$

$$6 = n$$

$$b) 3, 6, 12, \dots, 768$$

$\underbrace{\quad}_{\times 2} \quad \underbrace{\quad}_{\times 2}$

$$t_1 = 3$$

$$r = 2$$

$$t_n = 768$$

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

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

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

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

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

$$8 = n-1$$

$$8+1 = n$$

$$9 = n$$

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

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

$$t_n = t_1 r^{n-1}$$
$$625 = \left(\frac{1}{25}\right)(5)^{n-1}$$

$$r = 5$$

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

$$t_n = 625$$

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

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

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

$$6 = n-1$$

$$6+1 = n$$

$$7 = n$$