MATH 11 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.

$D_{[4]} = 24$ (Quartic)

$y = x^4 - 6x^3 + 25$

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

D_1 -4 -2 0 2 4

D_2 2 2 2 2

$D_{[2]} = 2$ (Quadratic)

$y = x^2 - 7x + 10$

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

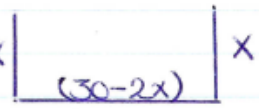
When $x = 4$ $y = -20(4)^2 + 300(4) + 500$

$y = -20(16) + 1200 + 500$

$y = -320 + 1200 + 500$

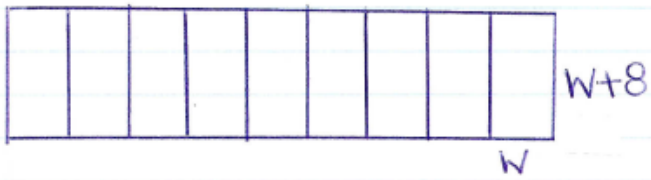
$y = 1380$

D. $1380

3. 

$P = 30m$
Let x = width
$30 - 2x$ = length

$A = l \times w$
$A = (30-2x)(x) \Rightarrow A$

4. 

$A = l \times w$
$10m^2 = (w+8)(w)$
$10m^2 = w^2 + 8w$
$0 = w^2 + 8w - 10 \Rightarrow B.$

Total Area $= 90m^2$

Area of 1 Section
$= \frac{90m^2}{9}$
$= 10m^2$

5.

$P = 200m$

Let x = width

$\frac{200-2x}{2}$ = length

$100 - x$ = length.

$A = l \times w$

$A = (100-x)x \Rightarrow A$

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

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

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

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

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

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

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

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

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

$= \frac{1}{256}$

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

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

$t_1 = 64$

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

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

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

$\Rightarrow t_7 = (64)\left(-\frac{1}{2}\right)^{7-1}$

$= (64)\left(-\frac{1}{2}\right)^{6}$

$= (64)\left(\frac{1}{64}\right)$

$= \frac{64}{64}$

$= 1$

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

$t_1 = 2x$

$r = 2x$

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

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

$\Rightarrow t_{10} = 2x(2x)^{10-1}$

$t_{10} = 2x(2x)^9$

$t_{10} = 2x(512x^9)$

$t_{10} = 1024x^{10}$

7.

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

$\times 3 \quad \times 3$

$t_1 = 4$

$r = 3$

$t_n = 972$

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

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

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

$243 = 3^{n-1}$

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

$5 = n-1$

$5+1 = n$

$6 = n$

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

$\times 2 \quad \times 2$

$t_1 = 3$

$r = 2$

$t_n = 768$

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

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

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

$256 = 2^{n-1}$

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

$8 = n-1$

$8+1 = n$

$9 = n$

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

($\times 5$, $\times 5$)

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

$r = 5$

$t_n = 625$

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

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

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

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

$15625 = 5^{n-1}$

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

$6 = n-1$

$6+1 = n$

$7 = n$