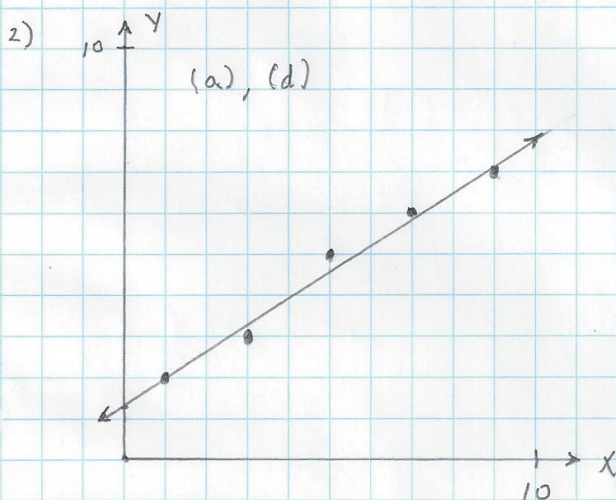


Lesson 1A.1:

1) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 7}{4 - 2} = \frac{-12}{2} = -2$, $y = -2x + b$, $7 = -2(-2) + b$,
 $7 = 4 + b$, $b = 3$, $y = -2x + 3$

Lesson 1A.2:



(b) $y = 0.65x + 1.35$

(c) $r = 0.9912$ (positive correlation)
 $r^2 = 0.9826$ (good correlation)

3) (a) $y = -2x + 3$

(b) $r^2 = 1$ (perfect correlation)

Lesson 1A.3:

4) $y = ax^2 + bx + c$

$(0, 9) \rightarrow 9 = a(0)^2 + b(0) + c \rightarrow c = 9$

$(4, 1) \rightarrow 1 = a(4)^2 + b(4) + c \rightarrow 16a + 4b + c = 1$

$(6, 3) \rightarrow 3 = a(6)^2 + b(6) + c \rightarrow 36a + 6b + c = 3$

$16a + 4b + 9 = 1 \rightarrow 16a + 4b = -8$ $-2.25(16a + 4b = -8) \rightarrow -36a - 9b = 18$

$36a + 6b + 9 = 3 \rightarrow 36a + 6b = -6$ $36a + 6b = -6$

$-36a - 9b = 18$
 $36a + 6b = -6$
 $-3b = 12$

$b = -4$, $16a + 4(-4) = -8$, $16a - 16 = -8$, $16a = 8$, $a = \frac{1}{2}$

$y = \frac{1}{2}x^2 - 4x + 9$

5) $y = 0.5x^2 - 4x + 9 = \frac{1}{2}x^2 - 4x + 9$ $r^2 = 1$ (perfect correlation)

HW # 1A

20F4

6)

X	Y
0	9
2	3
4	1
6	3
8	9
10	19

$$m(1) = \frac{3-9}{2-0} = -3$$

$$m(7) = \frac{9-3}{8-6} = 3$$

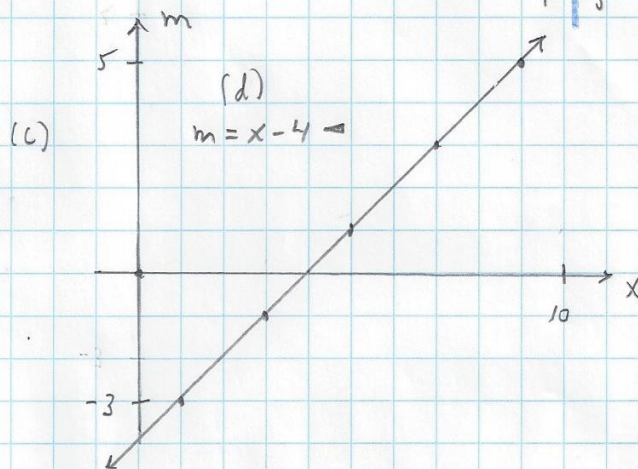
$$m(3) = \frac{1-3}{4-2} = -1$$

$$m(9) = \frac{19-9}{10-8} = 5$$

$$m(5) = \frac{3-1}{6-4} = 1$$

6)

X	m
1	-3
3	-1
5	1
7	3
9	5



Lesson 1A.4:

$$7) \quad 8x^2 + 22x - 21 = 0, \quad x = \frac{-22 \pm \sqrt{22^2 - 4(8)(-21)}}{2(8)} = \frac{-22 \pm \sqrt{1156}}{16} = \frac{-22 \pm 34}{16}$$

$$x = \frac{-22+34}{16} = \frac{12}{16} = \frac{3}{4} \quad x = \frac{-22-34}{16} = \frac{-56}{16} = -\frac{7}{2}$$

Lesson 1A.5:

$$8) \quad y = y_0 + v_0 t - \frac{1}{2} g t^2 = 42 + 30t - \frac{1}{2} (32.2) t^2, \quad y = -16.1 t^2 + 30t + 42$$

$$-16.1 t^2 + 30t + 42 = 0, \quad t = \frac{-30 \pm \sqrt{(30)^2 - 4(-16.1)(42)}}{2(-16.1)} = \frac{-30 \pm \sqrt{3604.8}}{-32.2}$$

$$t = -0.933 \text{ sec } \times \quad t = 2.796 \text{ sec } \checkmark$$

Lesson 1A.6:

$$9) \quad y = a \cdot b^x \quad (5, 204.20505) \rightarrow 204.20505 = a \cdot b^5 \quad (\div) \Rightarrow 9.261 = b^3$$

$$(2, 22.05000) \rightarrow 22.05000 = a \cdot b^2$$

$$b = \sqrt[3]{9.261} = 2.1 \quad 22.05 = a \cdot (2.1)^2, \quad a = 5, \quad y = 5(2.1)^x$$

10) $y = 5(2.1)^x \leftarrow r^2 = 1$ (perfect correlation) \leftarrow

11) $p = a \cdot b^t$ $2000 \rightarrow t=0$, $2020 \rightarrow t=20$, $2035 \rightarrow t=35$

$p = 144,174 \cdot b^t$ $180,355 = 144,174 \cdot b^{20}$, $b^{20} = \frac{180,355}{144,174}$

$b = \sqrt[20]{\frac{180,355}{144,174}} = 1.011258213$ (The population of Aurora increases by 1.13% per year) \leftarrow

$p = 144,174 \cdot b^{35} = 213,334 \leftarrow$

12) $g = a \cdot b^t$, $g = 20 \cdot b^t$, $10 = 20 \cdot b^8$, $b = \sqrt[8]{0.5} = 0.9170040432$

$1 - b = 8.3\%$ (each day, 8.3% of the sample decays) \leftarrow

$g = 20 \cdot b^{25} = 2.293$, $20 - 2.293 = 17.707$ grams have decayed \leftarrow

Lesson 1A.7

13)

X	Y
1	4.5
3	8.8
5	17.2
7	33.7
9	66.1

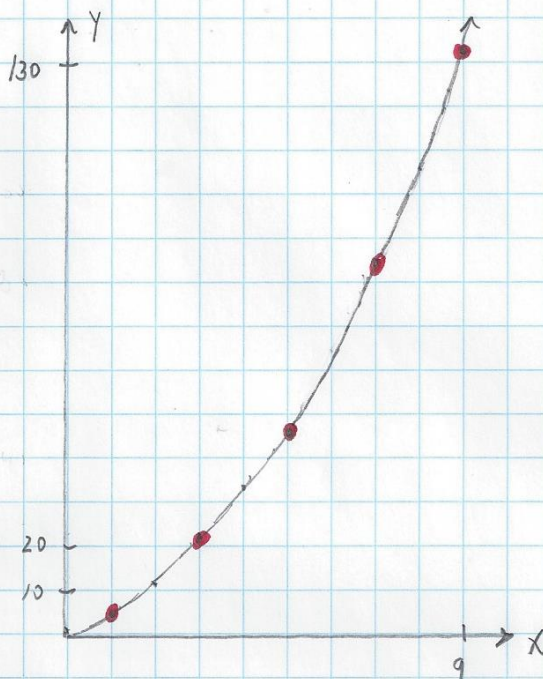


$y = 1.148x^2 - 4.077x + 8.555 \leftarrow$
 $r^2 = 0.99435 \leftarrow$

$y = 3.213(1.399)^x \leftarrow$
 $r^2 = 1.00000 \leftarrow$
 exponential regression is best \leftarrow

14)

x	y
1	3.9
3	20.1
5	46.6
7	83.5
9	131.2



$$y = 1.307x^2 + 2.839x - 0.289$$

$$r^2 = 1.00000$$

quadratic regression is best

$$y = 3.931(1.530)^x$$

$$r^2 = 0.96306$$

Lesson 1A.8:

15) Quadratic $\leftarrow y = y_0 + v_0 t - \frac{1}{2} g t^2, y_0 = 300, v_0 = 0, g = 32.2,$

$$y = 300 + 0 \cdot t - \frac{1}{2} (32.2) t^2, y = 300 - 16.1 t^2$$

16) Exponential $\leftarrow 1.025 = b^{0.25}, b = \sqrt[0.25]{1.025} = 1.03812891$

$$m = 5000 (1.03812891)^t$$

17) Linear \leftarrow

$$C = 50g + 125$$