Math 10C

KEY

L41 – 7.5 Word Problems

Part 1 – Word Problems

Use the following information to answer Q1-Q5:

A water delivery truck is filling an outdoor inflatable pool at the Siemens' household. The truck arrived with 3000 L of water. The number of litres, *L*, remaining in the truck at time, *t*, decreases at a rate of 120 L/min.

Q1: Write an equation describing how much water is in the truck.

$L = -120t + 3000$

Q2: How long would it take to empty the truck?

$0 = -120t + 3000$

$-3000 \quad -3000$

$-3000 = -120t$

$\div(-120) \quad \div(-120)$

$25 = t$ ⟹ It would take 25 minutes.

Q3: After 15 minutes, how much water has been drained?

$L = -120t + 3000$

$L = -120(15) + 3000$

$L = -1800 + 3000$

$L = 1200$ litres remaining in truck.

So we've drained 1800 L

Q4: How long will it take to fill the Siemens' 2200 litre pool?

Drained 2200? So we have 800 L left in the truck.

$L = -120t + 3000$

$800 = -120t + 3000$

$-3000 \quad -3000$

$-2200 = -120t$

$\div(-120) \quad \div(-120)$

$18.\overline{3} = t$

So $18\frac{1}{3}$ minutes, or 18min 20sec

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Q5: Build a table of values and graph the number of litres remaining in the truck, L, versus time, t.

t	L
x	y
0	3000
5	
10	
15	
25	0

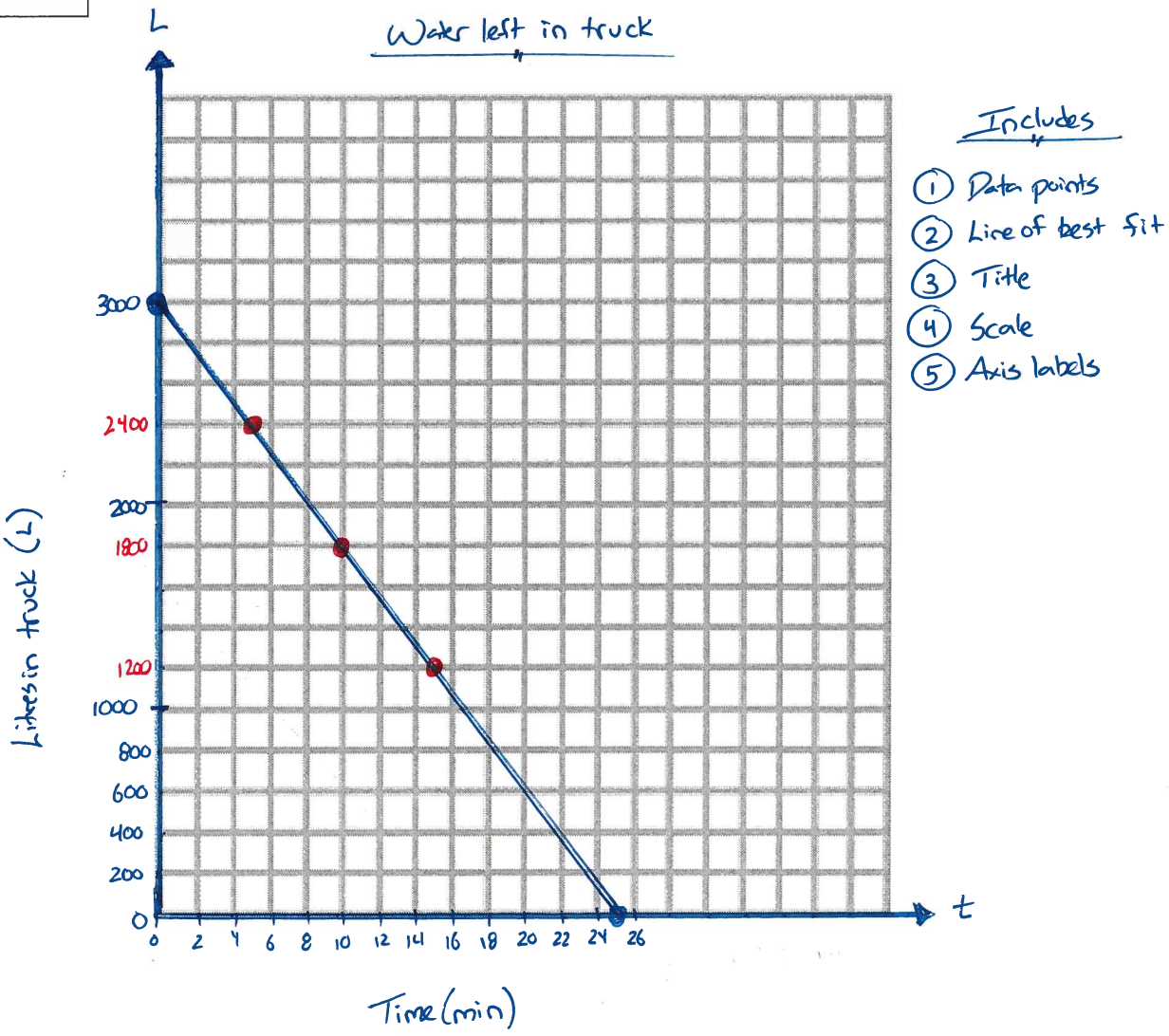
Easy to find proper scale using end points.

Extra points?

$L = -120(5) + 3000$
$= 2400$

$L = -120(10) + 3000$
$= 1800$

$L = -120(15) + 3000$
$= 1200$



Chapter 6 reminder:

Domain: $\{t \mid 0 \le t \le 25,\ t \in \mathbb{R}\}$

Range: $\{L \mid 0 \le L \le 3000,\ L \in \mathbb{R}\}$

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Use the following information to answer Q6-Q11:

At higher altitudes, water boils at lower temperatures because the air pressure is lower. Suppose water boils at 96.5°C at an altitude of 1000m, and at 93.0°C at an altitude of 2000m.

Q6: Fill in the following statement:

Boiling temp (*Dependent Variable*) depends on Altitude (*Independent Variable*).

Q7: Write both data points as ordered pairs (x,y).

(Altitude, Boiling Temp)

(1000, 96.5) and (2000, 93.0)

Q8: Write an equation of the line in *Slope y-Intercept Form*.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{93.0 - 96.5}{2000 - 1000} = \frac{-3.5}{1000} = -0.0035$$

$y = mx + b$

$y = -0.0035x + b$ Use (1000, 96.5)

$96.5 = -0.0035(1000) + b$

$96.5 = -3.5 + b$

$+3.5 \quad +3.5$

$100 = b$ $\Rightarrow$ $\boxed{y = -0.0035x + 100}$

Q9: What is the significance of the y-intercept? Explain.

Temperature that water boils at, at sea level.

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Q10: Build a table of values and graph the relationship.

Alt Temp

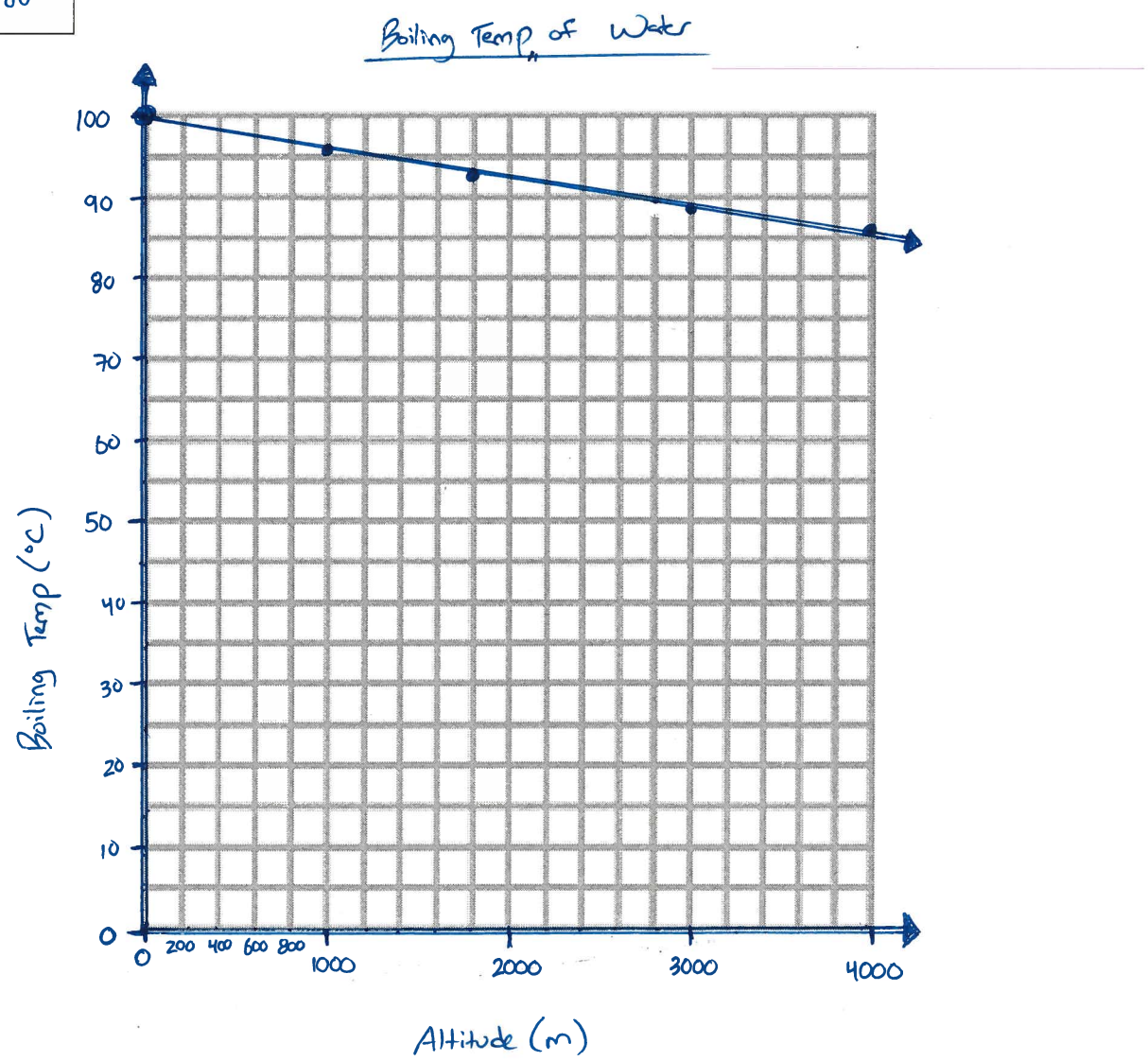
x	y
0	100
1000	96.5
2000	93.0
3000	89.5
4000	86

-3.5

-3.5

-3.5

-3.5



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Q11: Mountain climbers need to adjust their ingredients and cooking techniques when cooking at higher altitudes. What is the boiling temperature of water at an elevation of 4000m?

$y = -0.0035x + 100$

$y = -0.0035(4000) + 100$

$y = \boxed{86°C}$

Part 6 – Textbook Practice

Pg. 367 #11
Pg. 379 #13