

Solving Problems using Linear Relations

1. N, A, E

The pattern in each table below continues. For each table:

- Describe the pattern that relates v to t .
- ~~Write an equation that relates v to t .~~
- Write an equation that relates v to t .
- Verify your equation by substituting values from the table.

a)

Term Number, t	Term Value, v
1	11
2	22
3	33
4	44

b)

Term Number, t	Term Value, v
1	5
2	8
3	11
4	14

2. N, A, E

A pizza with tomato sauce and cheese costs \$9.00.

Each additional topping costs \$0.75.

- Create a table that shows the costs of a pizza for up to 5 toppings.
- Write an equation that relates the cost, C dollars, to the number of toppings, n . Verify your equation by substituting values of n from the table.
- Suppose a pizza costs \$15.00. How many toppings were ordered? What strategy did you use? ~~For different strategies to check your answer.~~

3. A, E

Clint has a window cleaning service.

He charges a fixed cost of \$12, plus \$1.50 per window.

- Write an equation that relates the total cost to the number of windows cleaned. How do you know that your equation is correct?
- Clint charged \$28.50 for a job. How many windows did he clean? How do you know?

4. A, E

The student council is planning to hold a dance. The profit in dollars is 4 times the number of students who attend, minus \$200 for the cost of the music.

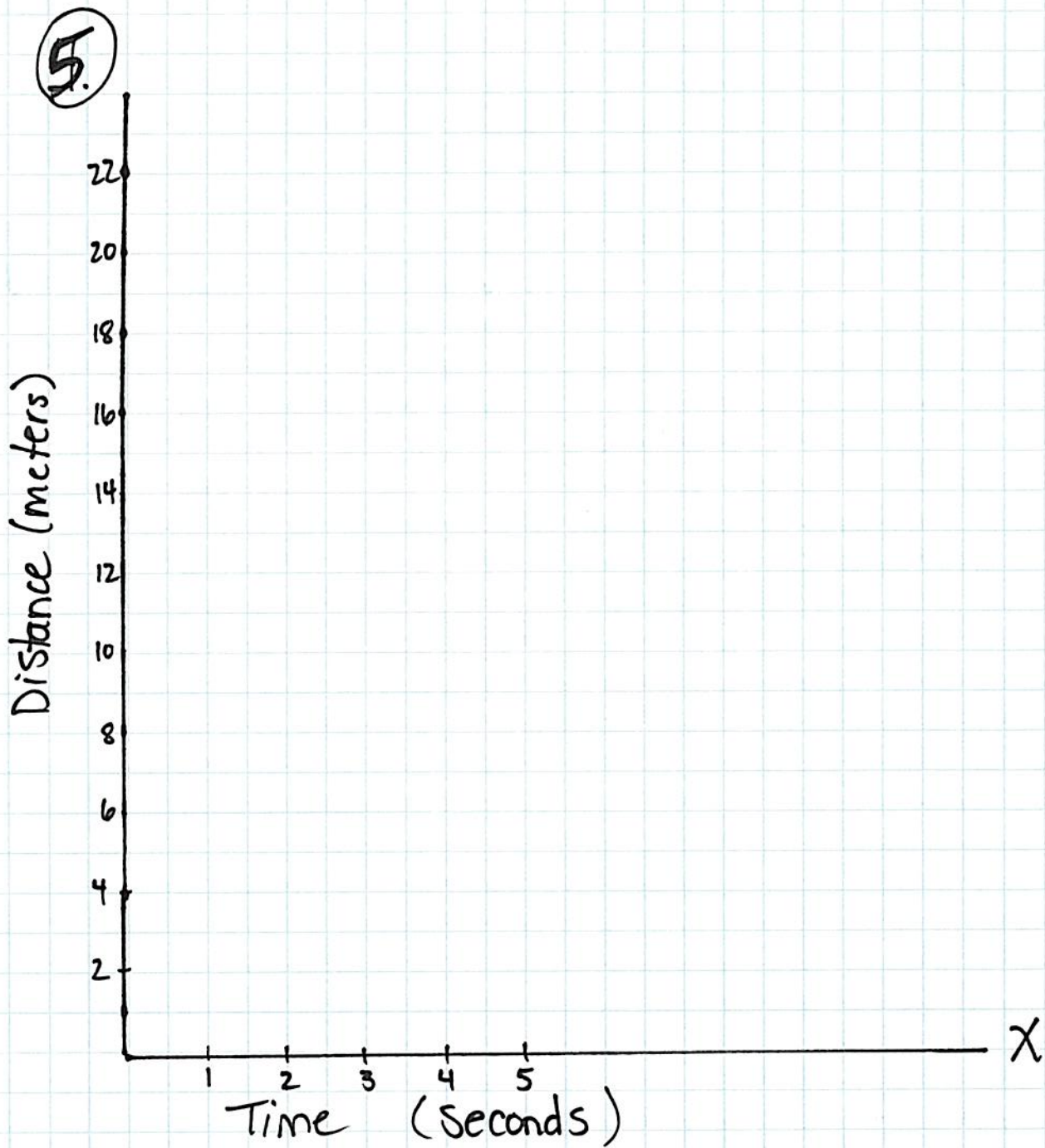
- Write an equation that relates the profit to the number of students who attend. ~~b) Create a table of values for this relation.~~
- ~~Graph the data. ~~Make sense to your partner.~~ Explain.~~
- How many students have to attend to make a profit?

5. N, A, E

Jin is cycling at an average speed of 4 m/s.

He travels a distance, d metres, in t seconds.

- Write an equation that relates d and t .
- Create a table of values for this relation.
- Graph the data. ~~Should you join the points?~~ **(Graph on back)** ~~Explain your reasoning.~~
- Is the relation between distance and time linear?
 - How do you know from the table of values?
 - How do you know from the graph?
- How far does Jin travel in 3.5 h?
- What time does it take Jin to travel 17 km? **A, E only**



Answers :

- ① a) i) As t increases by 1, v increases by 11 iii) $v = 11t$
 b) i) As t increases by 1, v increases by 3 iii) $v = 3t + 2$

②

(n) toppings	(C) Cost
1	9.75
2	10.50
3	11.25
4	12.00
5	12.75

b) $C = 0.75n + 9$
 or
 $C = 9 + 0.75n$

c) 8 toppings

③ a) $y = 1.5x + 12$
 b) 11 windows.

④ $P = 4n - 200$
 d) At least 51

⑤

t	d
1	4
2	8
3	12
4	16
5	20

d) linear
 e) 50.4 Km
 or
 50,400 m
 f) 4250 Sec
 or
 70.8 min