

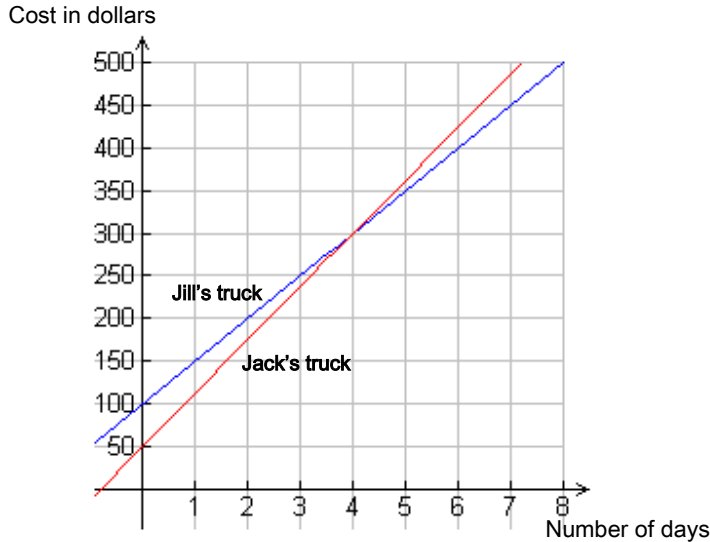
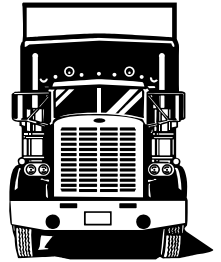
Name \_\_\_\_\_ Teacher \_\_\_\_\_ Date \_\_\_\_\_

PLEASE WRITE DOWN ALL OF YOUR WORKING

Question 1. To hire a truck, you have to pay

- a fixed amount PLUS
- a cost depending on how long you keep the truck.

This graph shows the cost of hiring Jill’s truck and the cost of hiring Jack’s truck.



- a) If you have \$400, for how many days can you hire Jill’s truck? \_\_\_\_\_
- b) What is the extra cost to hire Jill’s truck for one extra day? \_\_\_\_\_
- c) What is the fixed amount at the beginning of the hire of Jill’s truck? \_\_\_\_\_
- d) About how much does it cost to hire Jack’s truck for 2½ days? \_\_\_\_\_
- e) At what number of days is the cost of hiring Jill’s truck the same as the cost of hiring Jack’s truck? \_\_\_\_\_
- f) For what number of days rental is it more costly to hire Jill’s truck than Jack’s? \_\_\_\_\_
- g) Explain in words how to work out the cost of hiring Jill’s truck for 14 days WITHOUT USING THE GRAPH.
- h) Use algebra to write a rule connecting the cost in dollars with the number of days of hire of Jill’s truck.

Question 2. The MIRACLE vacuum cleaner costs \$136 and you must also buy disposable dust-bags that cost \$3 each. The WIZARD vacuum cleaner costs only \$110 but the disposable bags in this case cost \$4 each.

- a) How much would you pay for a MIRACLE vacuum cleaner and 4 bags? \_\_\_\_\_
- b) A shop sells the MIRACLE vacuum cleaner and some dust bags for a total of \$196. How many dust bags would you expect to get? \_\_\_\_\_
- c) Explain why: \_\_\_\_\_
- d) Mary bought a MIRACLE vacuum cleaner and some dust bags.



William bought a WIZARD vacuum cleaner and some dust bags.

By chance, Mary paid the same amount of money as William and she got the same number of dust bags.

- i) How many dust bags did they each get? \_\_\_\_\_
  - ii) How much money did they each spend? \_\_\_\_\_
- e) If you were buying a new vacuum cleaner which of these two options would you choose? Explain your answer.
  - f) Use algebra to write a rule that shows how to work out the cost in dollars of a WIZARD vacuum cleaner from the number of dust bags that you buy with it

Question 3. Chris is stacking plastic chairs at school. The height in centimetres of the top of the back of the highest chair in the stack may be described by  $h = 90 + 12c$ .



- a) What do you think  $h$  and  $c$  stand for?
- b) Chris has one chair in place. Construct a table that shows the height of the stack after he adds 0,1,2,3 more chairs.
- c) Chris must fit his stack of chairs underneath a staircase. What information does the algebra rule tell Chris about the height of stacks of chairs? (Hint: Write something about 90 and something about 12.)
- d) The school has bought some new chairs that are 75 cm high. These chairs do not fit as neatly and so adding each new chair adds 15cm to a stack. Write an algebra rule to work out the height of the stacks of new chairs.

Question 4.

- a) Find the value of the expression  $4b - 3$  when  $b = 6$ . \_\_\_\_\_
- b) Is  $p = 4$  a solution to the equation  $3p + 1 = p + 5$ ? YES / NO Why?
- c) Is  $p = 2$  a solution to the equation  $3p + 1 = p + 5$ ? YES / NO Why?
- d) If  $3n + 136 = 196$ , what is the value of  $n$ ? \_\_\_\_\_
- e) If  $136 + 3n = 110 + 4n$ , what is the value of  $n$ ? \_\_\_\_\_
- f) We know that  $x$  and  $y$  are numbers, and we know that  $y = 11 + (5x + 4)$  and that  $5x + 4 = 3$ .  
What number does  $y$  stand for?

Question 5. Look at the numbers in this table and answer the questions

$x$	$y$
0	110
1	114
2	118
3	122
4	126
12	158

- a) When  $x$  is 2, what is  $y$ ? \_\_\_\_\_
- b) When  $y$  is 126, what is  $x$ ? \_\_\_\_\_
- c) When  $x$  is 8, what is  $y$ ? \_\_\_\_\_
- d) When  $y$  is 150, what would you expect  $x$  to be? \_\_\_\_\_
- e) When  $x$  is 100, what would you expect  $y$  to be? \_\_\_\_\_
- f) Describe in words how you find  $y$  if you are told what  $x$  is.
- g) Write a rule connecting  $x$  and  $y$  using algebra.