1   Richard is a window cleaner.
For each house he visits, he charges a fixed amount of £5 plus 60p for each window cleaned.

(a) Sam's house has 10 windows.

How much does Richard charge to clean Sam's windows?

(a) .... **[1]**

(b) Richard's charges lead to the formula $C = 0.6w + 5$, where C is the charge in £ for cleaning the windows of a house with w windows.

Anna is also a window cleaner.
For each house she visits, she charges a fixed amount of £8 plus 20p for each window cleaned.

(i) Write down the formula to give the charge £C for Anna to clean the windows of a house with w windows.

(b)(i) .... **[1]**

(ii) Use algebra to find the value of w that gives the same charge for both Richard and Anna.

(ii) .... **[3]**

(iii) Comment on what your answer to part **(b)(ii)** means in real life.

.... **[1]**

2 (a) Complete the table of values for $y = 0.5^x$.

x	0	1				
y		0.5			0.0625	0.03125

[2]

(b) Draw the graph of $y = 0.5^x$ for $0 \leqslant x \leqslant 5$.
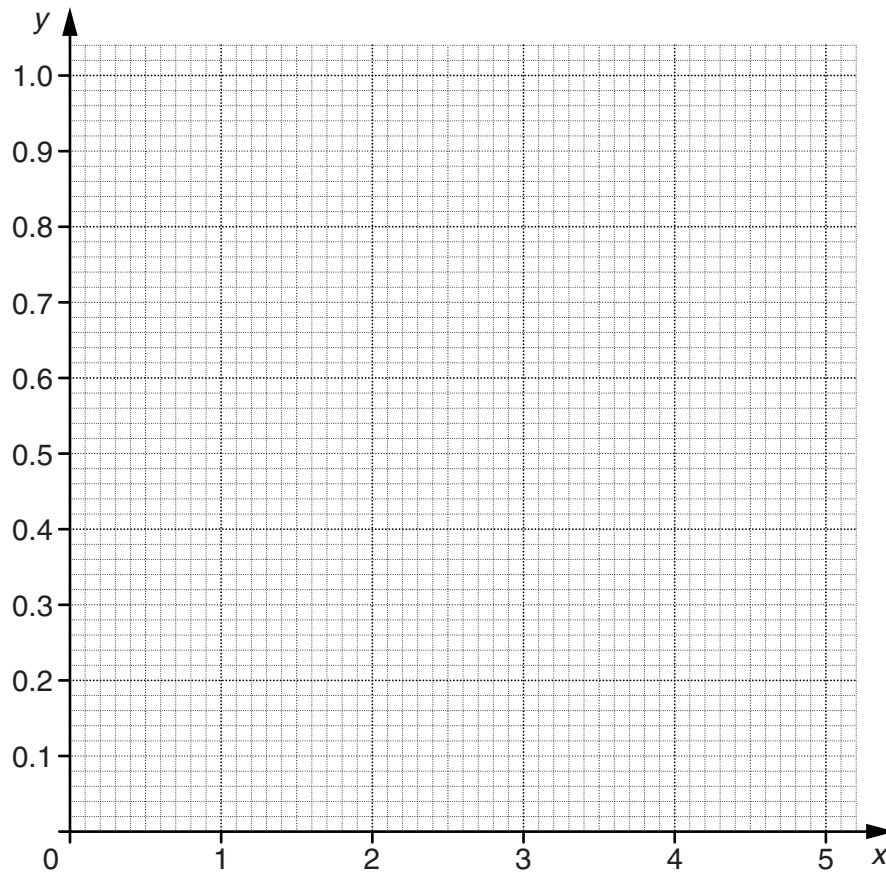
[2]

(c) Use your graph to solve this equation.

$$0.5^x = 0.4$$

(c) .... **[1]**

3 Write one of

| Equation | Expression | Formula | Identity |

as appropriate next to each of the following.

$2x + 9$ _____

$3x - 1 = 5$ _____

$3(2x - 1) = 6x - 3$ _____

[3]

4 **(a** For one day's hire, *Carol's Coaches* charges 30p for each mile travelled, plus £120.

Write a formula for the charge, £C, for one day's hire from *Carol's Coaches* when n miles are travelled.

(a) _____ **[2]**

(b) **(i)** This is the formula for the charge, £B, for one day's hire from *Ben's Buses* when n miles are travelled.

$B = 0.4n + 80$

Ben's Buses charged an athletics club £110 for one day's hire.

How many miles did the bus travel that day?

(b)(i) _____ miles **[3]**

(ii) *Ben's Buses* asks the athletics club to complete a customer satisfaction survey. Here is one question in the survey.

Don't you think that your bus hire was good value for money?

Make one criticism of the question and write an improved version of the question.

Criticism: _____

_____ **[1]**

Improved version: _____

_____

_____ **[1]**

5   Janet is planning a conference.
   The hotel charges £150 for the meeting room plus £70 for each person who attends.

   (a) Write a formula for the total charge, £C, when n people attend a conference.

   (a) $C =$ _____ **[2]**

   (b) Janet can afford a maximum total charge of £3300.

   Write an equation and solve it to find the largest number of people that could attend.

   (b) _____ **[3]**

6 **(a** Multiply out.

6(3*y* + 5)

(a) _____ **[1]**

(b) Factorise.

5*y* − 15

(b) _____ **[1]**

(c) Solve.

7*x* − 2 = 5*x* + 11

(c) _____ **[3]**

7 *Dave's Plumbing* charges £30 for a callout and £25 for each hour that a job takes.

(a) Write a formula for the total charge, £C, that *Dave's Plumbing* makes for a job taking n hours.

(a) _____ **[2]**

(b) Mrs Brown was charged £92.50 for a job that *Dave's Plumbing* did.

How long did the job take?

(b) _____ hours **[2]**

8   (a   Solve.

$$3(2x - 1) = 6$$

(a) _____ **[3]**

(b) Find the value of $3y^2 + 5$ when

(i) $y = 2.6,$

(b)(i) _____ **[1]**

(ii) $y = {}^-4.$

(ii) _____ **[1]**

9(a   A football stadium has 10 car parks and 2 coach parks.
Each car park has space for *m* cars.
Each coach park has space for *d* coaches.

Write an expression for the total number of cars and coaches that can park at the stadium.

(a) _____ **[2]**

(b) One Saturday afternoon, there are *t* coaches at a theme park.
There are 2*t* people in each coach.

(i)   Write an expression for the total number of people in the coaches.

(b)(i) _____ **[1]**

(ii)   Find the total number of people in the coaches if *t* = 20.

(ii) _____ **[1]**

10   **(a**   Simplify.

   $3a^2 \times 4a$

(a) _____ [2]

(b) Work out the value of $4b^2$ when $b = {}^-2.5$.

(b) _____ [2]

(c) Solve.

   $5(2x - 7) = 3$

(c)_____[3]

(d) Factorise.

   $12x^2 + 8xy$

(d)_____[2]