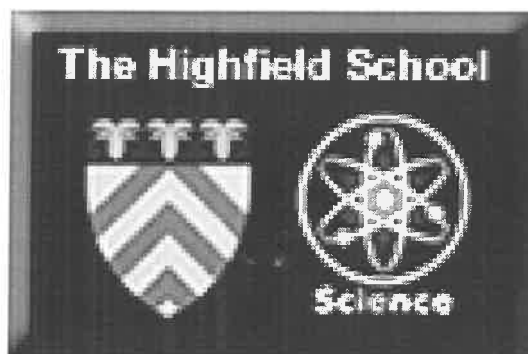


Year 12  
A-Level Bridging Project  
Mathematics



Name .....

Teacher Contact:  
Mrs Smith  
[abbysmith@highfield.herts.sch.uk](mailto:abbysmith@highfield.herts.sch.uk)

# Year 12 A level Mathematics Bridging Project

## **Topic: A-Level Foundation Skills**

**Task 1:** Create revisions guides, cards, posters, pod casts, PowerPoints, puzzles, games etc. on each of the following topics.

- Laws of indices – Surds, rationalising denominators, negative and fractional indices
- Basic Algebra skills - factorising, simplifying, solving equations, algebraic fractions, changing the subject,
- Quadratics - solving quadratics, sketching quadratics, completing the square, the difference of two squares
- Simultaneous equations – Through eliminations and substitution including linear and quadratic, intersections of lines.
- Straight line graphs – plotting and sketching, gradients, distance between two points
- Circles – Circle theorems, equations of a circle.

Use the check list provided to guide you.

**Task 2:** Complete the following questions provided on the topics above (page 4-9) and self-mark (page 12 – 17). You must show all of your workings and present your work neatly.

**Task 3:** Complete the assessment on page 11 in test conditions on a new clean page. Show all of your workings and present your work neatly. Maximum time – 30 minutes, no calculator allowed.

**OPTIONAL Task 4:** Research Project on page 9 and 10– this will not be marked, but will be useful later in the course.

All your work must be handed in in the first lesson back, this and the assessment will identify if you have a good understanding of the core skills needed to start A-Level Maths.

If you fail to complete the tasks and fail to achieve this will imply that you are not committed to the course and your and we will be considering your suitability for the course and meetings with the Head of Sixth form will take place.

Enjoy the summer break,

Maths Department

## Checklist

| Topic                                 | Skill                                 | Revised and created revision material | Assessed and completed the questions. |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Algebra                               | Brackets                              |                                       |                                       |
|                                       | Factorising                           |                                       |                                       |
|                                       | Solving equations                     |                                       |                                       |
| Laws of Indices                       | Fractional                            |                                       |                                       |
|                                       | Negative                              |                                       |                                       |
| Quadratics                            | Solving through factorising           |                                       |                                       |
|                                       | Solving through formula               |                                       |                                       |
|                                       | Solving through completing the square |                                       |                                       |
|                                       | Difference of two squares             |                                       |                                       |
| Simultaneous equations                | Solving through substitution          |                                       |                                       |
|                                       | Solving through eliminations          |                                       |                                       |
|                                       | Linear and quadratic                  |                                       |                                       |
| Inequalities                          | Solving inequalities                  |                                       |                                       |
| OPTIONAL Extension:                   |                                       |                                       |                                       |
| Binomial theorem                      |                                       |                                       |                                       |
| Factor Theorem and Remainder theorem. |                                       |                                       |                                       |

## Section 1: ALGEBRA

### REMOVING BRACKETS

**EXERCISE A** Multiply out the following brackets and simplify.

1.  $7(4x + 5)$

2.  $-3(5x - 7)$

3.  $5a - 4(3a - 1)$

4.  $4y + y(2 + 3y)$

5.  $5(2x - 1) - (3x - 4)$

6.  $(x + 2)(x + 3)$

7.  $(t - 5)(t - 2)$

8.  $(2x + 3y)(3x - 4y)$

9.  $(2y - 1)(2y + 1)$

10.  $(3 + 5x)(4 - x)$

**EXERCISE B** Multiply out

1.  $(x - 1)^2$

2.  $(3x + 5)^2$

3.  $(7x - 2)^2$

4.  $(x + 2)(x - 2)$

5.  $(3x + 1)(3x - 1)$

6.  $(5y - 3)(5y + 3)$

### FACTORISING

**EXERCISE C:** Factorise each of the following

1)  $3x + xy$

2)  $4x^2 - 2xy$

3)  $pq^2 - p^2q$

4)  $3pq - 9q^2$

5)  $2x^3 - 6x^2$

6)  $8a^5b^2 - 12a^3b^4$

7)  $5y(y - 1) + 3(y - 1)$

**EXERCISE D** Factorise

1)  $x^2 - x - 6$

2)  $x^2 + 6x - 16$

3)  $2x^2 + 5x + 2$

4)  $2x^2 - 3x$

5)  $10x^2 + 5x - 30$

6)  $4x^2 - 25$

7)  $4x^2 - 12x + 8$

8)  $16m^2 - 81n^2$

9)  $4y^3 - 9a^2y$

10)  $8(x + 1)^2 - 2(x + 1) - 10$

## SOLVING

### EXERCISE E Solving

1)  $2x + 5 = 19$

2)  $5x - 2 = 13$

3)  $11 - 4x = 5$

4)  $5 - 7x = -9$

5)  $11 + 3x = 8 - 2x$

6)  $7x + 2 = 4x - 5$

7)  $5(2x - 4) = 4$

8)  $4(2 - x) = 3(x - 9)$

9)  $8 - (x + 3) = 4$

10)  $14 - 3(2x + 3) = 2$

### EXERCISE F Solving

1)  $\frac{1}{2}(x+3) = 5$

3)  $\frac{y}{4} + 3 = 5 - \frac{y}{3}$

5)  $\frac{7x-1}{2} = 13 - x$

7)  $2x + \frac{x-1}{2} = \frac{5x+3}{3}$

2)  $\frac{2x}{3} - 1 = \frac{x}{3} + 4$

4)  $\frac{x-2}{7} = 2 + \frac{3-x}{14}$

6)  $\frac{y-1}{2} + \frac{y+1}{3} = \frac{2y+5}{6}$

8)  $2 - \frac{5}{x} = \frac{10}{x} - 1$

## Section 2: LAWS OF INDICES AND SURDS

### LAWS OF INDICES

**EXERCISE H** Simplify the following:

1)  $b \times 5b^5 =$

2)  $3c^2 \times 2c^5 =$

3)  $b^2c \times bc^3 =$

4)  $2n^6 \times (-6n^2) =$

5)  $8n^8 \div 2n^3 =$

6)  $d^{11} \div d^9 =$

7)  $(a^3)^2 =$

8)  $(-d^4)^3 =$

### EXERCISE I

Find the value of:

1)  $4^{1/2}$

2)  $27^{1/3}$

3)  $\left(\frac{1}{9}\right)^{1/2}$

4)  $5^{-2}$

5)  $18^0$

6)  $7^{-1}$

7)  $27^{2/3}$

8)  $\left(\frac{2}{3}\right)^{-2}$

9)  $8^{-2/3}$

10)  $(0.04)^{1/2}$

11)  $\left(\frac{8}{27}\right)^{2/3}$

12)  $\left(\frac{1}{16}\right)^{-3/2}$

Simplify each of the following:

13)  $2a^{1/2} \times 3a^{5/2}$

14)  $x^3 \times x^{-2}$

15)  $(x^2y^4)^{1/2}$

## Section 3: QUADRATICS

### SOLVING QUADRATIC EQUATIONS

#### EXERCISE K

1) Use factorisation to solve the following equations:

a)  $x^2 + 3x + 2 = 0$

b)  $x^2 - 3x - 4 = 0$

c)  $x^2 = 15 - 2x$

2) Find the solutions of the following equations:

a)  $x^2 + 3x = 0$

b)  $x^2 - 4x = 0$

c)  $4 - x^2 = 0$

3) Solve the following equations either by factorising or by using the formula:

a)  $6x^2 - 5x - 4 = 0$

b)  $8x^2 - 24x + 10 = 0$

4) Use the formula to solve the following equations to 3 significant figures. Some of the equations can't be solved.

a)  $x^2 + 7x + 9 = 0$

b)  $6 + 3x = 8x^2$

c)  $4x^2 - x - 7 = 0$

d)  $3x^2 = 13x - 16$

## Section 4: SIMULTANEOUS EQUATIONS

### EXERCISE L

Solve the pairs of simultaneous equations in the following questions:

1)  $x + 2y = 7$   
 $3x + 2y = 9$

2)  $x + 3y = 0$   
 $3x + 2y = -7$

3)  $3x - 2y = 4$   
 $2x + 3y = -6$

4)  $9x - 2y = 25$   
 $4x - 5y = 7$

5)  $4a + 3b = 22$   
 $5a - 4b = 43$

6)  $3p + 3q = 15$   
 $2p + 5q = 14$

7)  $x^2 + y = 24$   
 $y = 2x$

8)  $x^2 - 2y = 15$   
 $y = 2x + 3$

9)  $y = 3 - x^2$   
 $y = 1 - x$



## Section 5: SOLVING INEQUALITIES

**EXERCISE M:** Solve the inequality

- a)  $2n - 1 \leq n + 3$ .
- b)  $4x - 5 < -3$
- c)  $3(x - 2) < 15$
- d)  $2(4t - 3) \geq 34$
- e)  $4x + 1 \geq 3x - 5$
- f)  $5t - 3 \leq 2t + 5$
- g)  $5w - 7 \leq 3w + 4$
- h)  $2(4x - 1) \leq 3(x + 4)$

### EXERCISE N

Solve the inequalities

- a)  $5 - 3x < 11$
- b)  $-4c > 12$
- c)  $2(q - 3) \leq 5 + 7q$

## Optional Task - Research

### Binomial:

(1) A company owns 400 laptops. Each laptop has an 8% probability of not working. You randomly select 20 laptops for your salespeople.

- (a) What is the likelihood that 5 will be broken?
- (b) What is the likelihood that they will all work?
- (c) What is the likelihood that they will all be broken?

13 In a supermarket chain there are a large number of employees, of whom 40% are male.

(a) One employee is chosen to undergo training.  
What assumption is made if 0.4 is taken to be the probability that this employee is male? [1]

(b) 6 employees are chosen at random to undergo training.  
(i) Show that  $P(\text{all 6 chosen are female}) = 0.0467$ , correct to 4 decimal places. [2]

Find the probability that

(ii) 3 are male and 3 are female, [4]

(iii) there are more females than males chosen. [5]

### Factor and Remainder Theorem:

9 The function  $f(x)$  is defined by  $f(x) = x^3 + 2x^2 - 5x - 6$ .

(i) Show that when  $f(x)$  is divided by  $(x - 3)$  the remainder is 24. [2]

(ii) Show that  $(x - 2)$  is a factor of  $f(x)$ . [1]

(iii) Hence solve the equation  $f(x) = 0$ . [4]

11 In this question  $f(x) = x^3 - 2x^2 - 4x - k$

(i) You are asked to find the values of  $k$  which satisfy the following conditions.

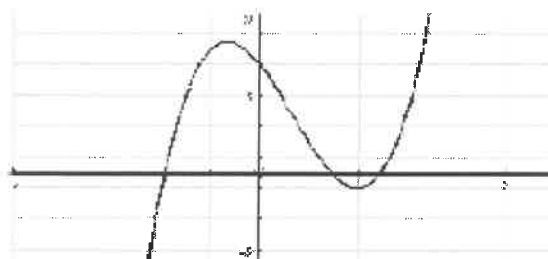
(A) The graph of  $y = f(x)$  goes through the origin. [1]

(B) The graph of  $y = f(x)$  intersects with the  $y$  axis at  $(0, -2)$ . [1]

(C)  $(x - 2)$  is a factor of  $f(x)$ . [2]

(D) The remainder when  $f(x)$  is divided by  $(x + 1)$  is 5. [2]

(E) The graph of  $y = f(x)$  is as shown in the diagram below. [1]



(ii) Find the solution of the equation  $f(x) = 0$  when  $k = 8$ .  
Sketch a graph of  $y = f(x)$  in this case. [5]

**Algebraic Expressions – Test B (30 mins)**

Fundamentals  Challenge  Expert

*Subtopics: Index laws, expanding brackets, factorising, negative and fractional indices, surds, rationalising denominators*

1. **Expand** the brackets and **simplify** fully:
 

|                 |                      |                      |     |
|-----------------|----------------------|----------------------|-----|
| a) $(4+x)(9-x)$ | b) $(x+2)(x^2-4x+3)$ | c) $(x-1)(x+6)(x-3)$ | [6] |
|-----------------|----------------------|----------------------|-----|
  
2. **Factorise** fully:
 

|                |                |                     |     |
|----------------|----------------|---------------------|-----|
| a) $16-6x-x^2$ | b) $5y^2-8y-4$ | c) $3x^3-12x^2-36x$ | [6] |
|----------------|----------------|---------------------|-----|
  
3. **Simplify** the following expressions:
 

|                             |   |                          |     |
|-----------------------------|---|--------------------------|-----|
| a) $\frac{12y^{15}}{18y^5}$ | b) $x^{\frac{5}{3}} \times x^{\frac{7}{3}}$ | c) $(x^4)^{\frac{3}{2}}$ | [3] |
|-----------------------------|---|--------------------------|-----|
  
4. **Simplify** as fully as possible:
 

|                            |                                  |                                |     |
|----------------------------|----------------------------------|--------------------------------|-----|
| a) $\sqrt{32} + \sqrt{18}$ | b) $\frac{\sqrt{120}}{\sqrt{5}}$ | c) $\sqrt{7} \times 4\sqrt{7}$ | [7] |
|----------------------------|----------------------------------|--------------------------------|-----|
  
5. Write the following in the form  $x^n$ , where  $n$  is a constant:
 

|                                   |                      |                      |     |
|-----------------------------------|----------------------|----------------------|-----|
| a) $\sqrt{x^3} \times \sqrt{x^8}$ | b) $(\sqrt[4]{x})^7$ | c) $(\sqrt[3]{x})^2$ | [7] |
|-----------------------------------|----------------------|----------------------|-----|
  
6. Evaluate:
 

|                       |                        |  |     |
|-----------------------|------------------------|--|-----|
| a) $64^{\frac{1}{3}}$ | b) $27^{-\frac{2}{3}}$ |  | [3] |
|-----------------------|------------------------|--|-----|
  
7. **Rationalise** the denominator of  $\frac{1}{5-2\sqrt{3}}$  [4]
  
8. **Simplify** as fully as possible:
 

|   |                           |  |     |
|---|---------------------------|--|-----|
| a) $6x^2 \times 9x^7 \times \frac{1}{3}x^5$ | b) $(9x^4)^{\frac{3}{2}}$ | c) $\sqrt{63} - \sqrt{48} - \sqrt{28}$ | [8] |
|---|---------------------------|--|-----|
  
9. Factorise  $9x^2 - y^2$  (*Hint:  $9x^2 = (3x)^2$* ) [2]
  
10. a) Expand and simplify  $(5 + \sqrt{11})(3 - \sqrt{11})$  [2]  
 b) Hence write  $\frac{8}{(5 + \sqrt{11})(3 - \sqrt{11})}$  in the form  $a + b\sqrt{11}$  where  $a$  and  $b$  are fractions. [4]
  
11. Write the following in the form  $kx^n$ , where  $k$  and  $n$  are constants:
 

|                            |                                   |  |     |
|----------------------------|-----------------------------------|--|-----|
| a) $(25x^4)^{\frac{1}{2}}$ | b) $\sqrt{36x^5} \div \sqrt{x^3}$ |  | [5] |
|----------------------------|-----------------------------------|--|-----|
  
12. Find the value of  $x$  such that  $64^x = 32$  [3]

**TOTAL 60 MARKS**

## Section 1: ALGEBRA

### REMOVING BRACKETS

**EXERCISE A** Multiply out the following brackets and simplify.

1.  $7(4x + 5) \quad 28x + 35$

2.  $-3(5x - 7) \quad -15x + 21$

3.  $5a - 4(3a - 1) \quad -7a + 4$

4.  $4y + y(2 + 3y) \quad 6y + 3y^2$

5.  $5(2x - 1) - (3x - 4) \quad 7x - 1$

6.  $(x + 2)(x + 3) \quad x^2 + 5x + 6$

7.  $(t - 5)(t - 2) \quad t^2 - 7t + 10$

8.  $(2x + 3y)(3x - 4y) \quad 6x^2 + xy - 12y^2$

9.  $(2y - 1)(2y + 1) \quad 4y^2 - 1$

10.  $(3 + 5x)(4 - x) \quad 12 + 17x - 5x^2$

**EXERCISE B** Multiply out

1.  $(x - 1)^2 \quad x^2 - 2x + 1$

2.  $(3x + 5)^2 \quad 9x^2 + 30x + 25$

3.  $(7x - 2)^2 \quad 49x^2 - 28x + 4$

4.  $(x + 2)(x - 2) \quad x^2 - 4$

5.  $(3x + 1)(3x - 1) \quad 9x^2 - 1$

6.  $(5y - 3)(5y + 3) \quad 25y^2 - 9$

### FACTORISING

**EXERCISE C:** Factorise each of the following

1)  $3x + xy \quad x(3 + y)$

2)  $4x^2 - 2xy \quad 2x(2x - y)$

3)  $pq^2 - p^2q \quad pq(q - p)$

4)  $3pq - 9q^2 \quad 3q(p - 3q)$

5)  $2x^3 - 6x^2 \quad 2x^2(x - 3)$

6)  $8a^5b^2 - 12a^3b^4 \quad 4a^3b^2(2a^2 - 3b^2)$

7)  $5y(y - 1) + 3(y - 1) \quad 5y^2 - 5y + 3y - 3 = 5y^2 - 2y - 3$

**EXERCISE D** Factorise

1)  $x^2 - x - 6 \quad (x - 3)(x + 2)$

2)  $x^2 + 6x - 16 \quad (x + 8)(x - 2)$

3)  $2x^2 + 5x + 2 \quad (2x + 1)(x + 2)$

4)  $2x^2 - 3x \quad x(2x - 3)$

5)  $10x^2 + 5x - 30 \quad 5(2x - 3)(x + 2)$

6)  $4x^2 - 25 \quad (2x + 5)(2x - 5)$

7)  $4x^2 - 12x + 8 \quad 4(x - 2)(x - 1)$   
 $4(x^2 - 3x + 2)$

8)  $16m^2 - 81n^2 \quad (4m - 9n)(4m + 9n)$

9)  $4y^3 - 9a^2y \quad y(2y - 3a)(2y + 3a)$

10)  $8(x + 1)^2 - 2(x + 1) - 10$

$2(4x + 5)(x - 4)$

## SOLVING

### EXERCISE E Solving

1)  $2x + 5 = 19$   $x = 7$

2)  $5x - 2 = 13$   $x = 3$

3)  $11 - 4x = 5$   $x = 1.5$

4)  $5 - 7x = -9$   $x = 2$

5)  $11 + 3x = 8 - 2x$   $x = -3/5$

6)  $7x + 2 = 4x - 5$   $x = -7/3$

7)  $5(2x - 4) = 4$   $x = 2.4$

8)  $4(2 - x) = 3(x - 9)$   $x = 5$

9)  $8 - (x + 3) = 4$   $x = 1$

10)  $14 - 3(2x + 3) = 2$   $x = 1/2$

### EXERCISE F Solving

1)  $\frac{1}{2}(x + 3) = 5$   $x = 7$

3)  $\frac{y}{4} + 3 = 5 - \frac{y}{3}$   $y = \frac{24}{7}$

5)  $\frac{7x - 1}{2} = 13 - x$   $x = 3$

7)  $2x + \frac{x - 1}{2} = \frac{5x + 3}{3}$   $x = 9/5$

2)  $\frac{2x}{3} - 1 = \frac{x}{3} + 4$   $x = 15$

4)  $\frac{x - 2}{7} = 2 + \frac{3 - x}{14}$   $x = \frac{35}{3}$

6)  $\frac{y - 1}{2} + \frac{y + 1}{3} = \frac{2y + 5}{6}$   $y = 2$

8)  $2 = \frac{5}{x} = \frac{10}{x} - 1$   $x = 5$

## Section 2: LAWS OF INDICES AND SURDS

### LAWS OF INDICES

**EXERCISE H** Simplify the following:

1)  $b \times 5b^5 = 5b^6$

2)  $3c^2 \times 2c^5 = 6c^7$

3)  $b^2c \times bc^3 = b^3c^4$

4)  $2n^6 \times (-6n^2) = -12n^8$

5)  $8n^8 \div 2n^3 = 4n^5$

6)  $d^{11} \div d^9 = d^2$

7)  $(a^3)^2 = a^6$

8)  $(-d^4)^3 = -d^{12}$

### EXERCISE I

Find the value of:

1)  $4^{1/2} = 2$

2)  $27^{1/3} = 3$

3)  $(1/9)^{1/2} = 1/3$

4)  $5^{-2} = 1/25$

5)  $18^0 = 1$

6)  $7^{-1} = 1/7$

7)  $27^{2/3} = 4$

8)  $(2/3)^{-2} = (3/2)^2 = 9/4$

9)  $8^{-2/3} = (1/2)^2 = 1/4$

10)  $(0.04)^{1/2} = (4/100)^{1/2} = 2/10 = 0.2$

11)  $(8/27)^{2/3} = 4/9$

12)  $(1/16)^{-3/2} = 64$

Simplify each of the following:

13)  $2a^{1/2} \times 3a^{5/2} = 6a^3$

14)  $x^3 \times x^{-2} = x$

15)  $(x^2y^4)^{1/2} = xy^2$

## Section 3: QUADRATICS

### SOLVING QUADRATIC EQUATIONS

#### EXERCISE K

1) Use factorisation to solve the following equations:

a)  $x^2 + 3x + 2 = 0$   $x = -1, -2$   
 $(x+2)(x+1) = 0$

b)  $x^2 - 3x - 4 = 0$   $x = -1, 4$   
 $(x-4)(x+1) = 0$

c)  $x^2 = 15 - 2x$   $x = -5, 3$   
 $x^2 + 2x - 15 = 0$   
 $(x+5)(x-3) = 0$

2) Find the solutions of the following equations:

a)  $x^2 + 3x = 0$   $x = 0, -3$   
 $x(x+3) = 0$

b)  $x^2 - 4x = 0$   $x = 0, 4$   
 $x(x-4) = 0$

c)  $4 - x^2 = 0$   $x = 2, -2$   
 $(2-x)(2+x) = 0$

3) Solve the following equations either by factorising or by using the formula:

a)  $6x^2 - 5x - 4 = 0$   
 $x = \frac{16}{12}, -\frac{1}{2}$

b)  $8x^2 - 24x + 10 = 0$   
 $x = 2.5, 0.5$

4) Use the formula to solve the following equations to 3 significant figures. Some of the equations can't be solved.

a)  $x^2 + 7x + 9 = 0$   
 $x = -1.70, -5.30$

b)  $6 + 3x = 8x^2$   $x = 1.07, -0.699$   
 $8x^2 - 3x - 6 = 0$

c)  $4x^2 - x - 7 = 0$   
 $x = 1.45, -1.20$

d)  $3x^2 = 13x - 16$   $x = 5.33, -1$   
 $3x^2 - 13x + 16 = 0$

## Section 4: SIMULTANEOUS EQUATIONS

### EXERCISE L

Solve the pairs of simultaneous equations in the following questions:

1)  $x + 2y = 7$   
 $3x + 2y = 9$

$$\begin{array}{r} 2x = 2 \\ x = 1 \end{array} \quad y = 3$$

3)  $3x - 2y = 4$   
 $2x + 3y = -6$   
 $6x - 4y = 8$   
 $6x + 9y = -18$   


---

 $-13y = 26$

$$\begin{array}{l} y = -2 \\ x = 0 \end{array}$$

5)  $4a + 3b = 22$   
 $5a - 4b = 43$   
 $20a + 15b = 110$   
 $20a - 16b = 172$   


---

 $31b = -62$

$$\begin{array}{l} b = -2 \\ a = 7 \end{array}$$

7)  $x^2 + y = 24$   
 $y = 2x$   
 $x^2 + 2x - 24 = 0$   
 $(x+6)(x-4) = 0$

$$\begin{array}{l} x = 4 \quad | \quad -6 \\ y = 8 \quad | \quad -12 \end{array}$$

9)  $y = 3 - x^2$   
 $y = 1 - x$

$$1 - x = 3 - x^2$$

$$x^2 - x - 2 = 0$$

$$(x-2)(x+1) = 0$$

$$x = -1 \quad | \quad x = 2$$

$$y = 2 \quad | \quad y = -1$$

2)  $x + 3y = 0$

$$\begin{array}{r} 3x + 2y = -7 \\ -3x + 9y = 0 \end{array}$$

$$\begin{array}{r} 7y = 7 \\ y = 1 \end{array} \quad x = -3$$

4)  $9x - 2y = 25$

$$4x - 5y = 7$$

$$\begin{array}{r} -36x - 8y = 100 \\ -36x - 45y = 63 \end{array}$$

$$37y = 37$$

$$\begin{array}{l} y = 1 \\ x = 3 \end{array}$$

6)  $3p + 3q = 15$

$$2p + 5q = 14$$

$$6p + 6q = 30$$

$$6p + 15q = 42$$

$$9q = 12$$

$$q = \frac{12}{9} = \frac{4}{3}$$

$$6p = 22$$

$$p = \frac{22}{6} = \frac{11}{3}$$

8)  $x^2 - 2y = 15$

$$y = 2x + 3$$

$$x^2 - 4x - 6 = 15$$

$$x^2 - 4x - 21 = 0$$

$$(x-7)(x+3) = 0$$

$$x = 7$$

$$y = 17$$

$$x = -3$$

$$y = -3$$



## Section 5: SOLVING INEQUALITIES

**EXERCISE M:** Solve the inequality

a)  $2n - 1 \leq n + 3$      $n \leq 4$

b)  $4x - 5 < -3$      $4x \leq 2$      $x \leq \frac{1}{2}$

c)  $3(x - 2) < 15$      $x - 2 < 5$      $x < 7$

d)  $2(4t - 3) \geq 34$      $4t - 3 \geq 17$      $4t \geq 20$      $t \geq 5$

e)  $4x + 1 \geq 3x - 5$      $x \geq -6$

f)  $5t - 3 \leq 2t + 5$      $3t \leq 8$      $t \leq \frac{8}{3}$

g)  $5w - 7 \leq 3w + 4$      $2w \leq 11$      $w \leq \frac{11}{2}$

h)  $2(4x - 1) \leq 3(x + 4)$      $5x \leq 14$      $x \leq \frac{14}{5}$   
 $8x - 2$      $3x + 12$

### EXERCISE N

Solve the inequalities

a)  $5 - 3x < 11$      $x > -2$

b)  $-4c > 12$      $c < -3$

c)  $2(q - 3) \leq 5 + 7q$

$2q - 6 \leq 5 + 7q$

$-11 \leq 5q$

$q \geq -\frac{11}{5}$

## Optional Task - Research

### Binomial:

(1) A company owns 400 laptops. Each laptop has an 8% probability of not working. You randomly select 20 laptops for your salespeople.

(a) What is the likelihood that 5 will be broken?

(b) What is the likelihood that they will all work?

(c) What is the likelihood that they will all be broken?