



Year 10 2023 Mathematics 2024 Unit 18 Booklet

HGS Maths



Tasks



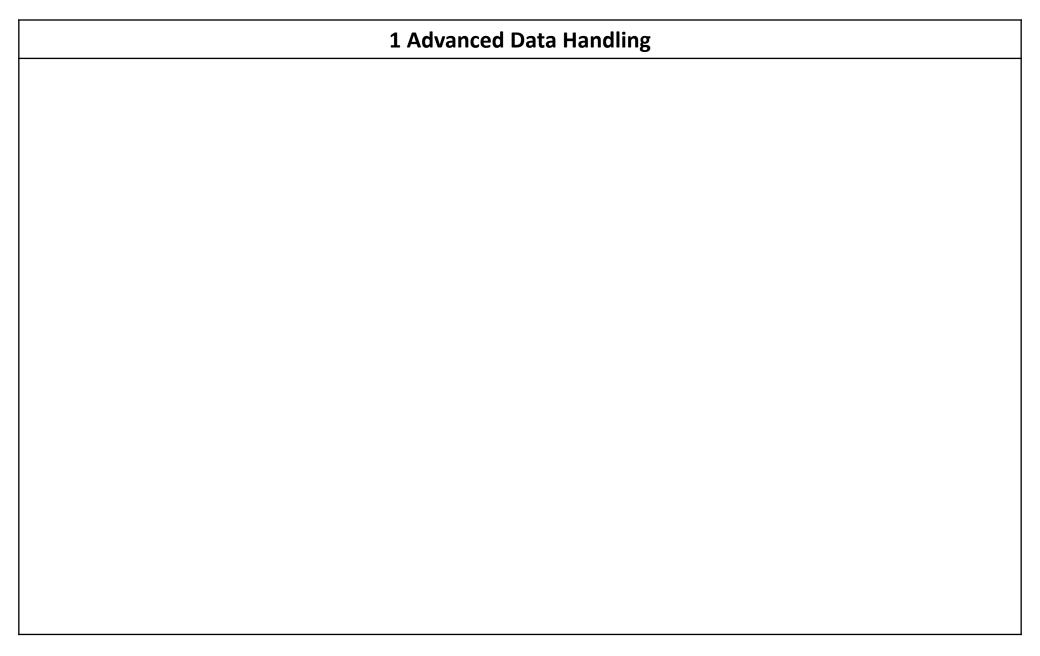
Dr Frost Course



Name:			

Class:

Contents Page Advanced Data Handling 1 **Expand Binomials** 2 **Solving Quadratics** 3



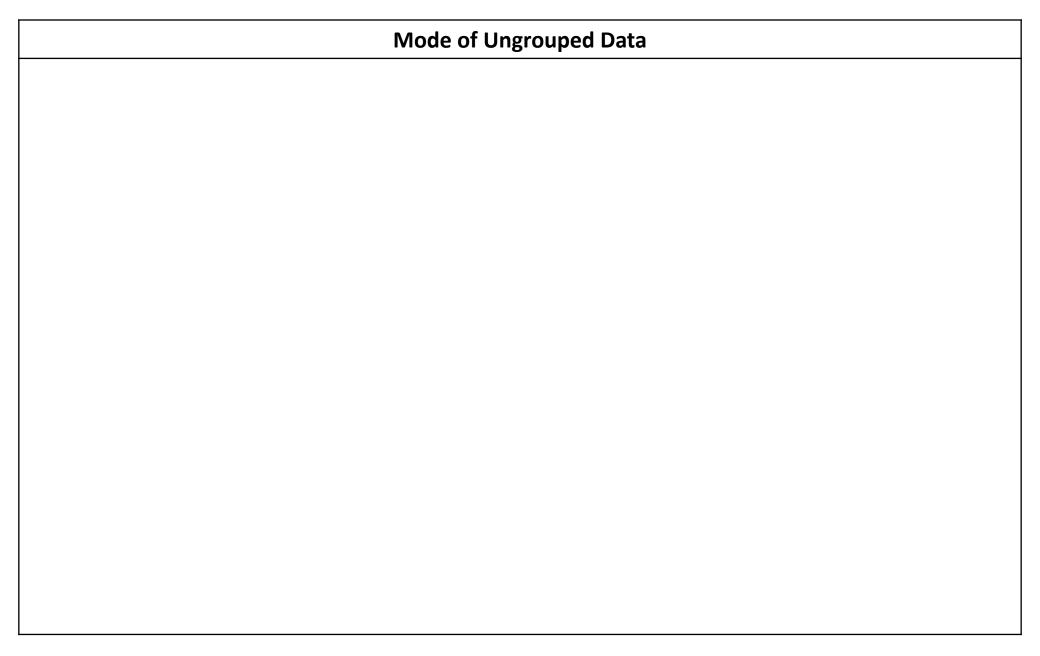
Ungrouped Frequency Tables

25 packets of sweets were opened. The numbers of sweets in the packets were:

11, 8, 9, 12, 10, 10, 9, 8, 9, 13, 9, 11, 10, 10, 12, 12, 10, 10, 10, 11, 12, 8, 9, 8, 9

Construct a frequency table to show this data:

Number of sweets	Frequency



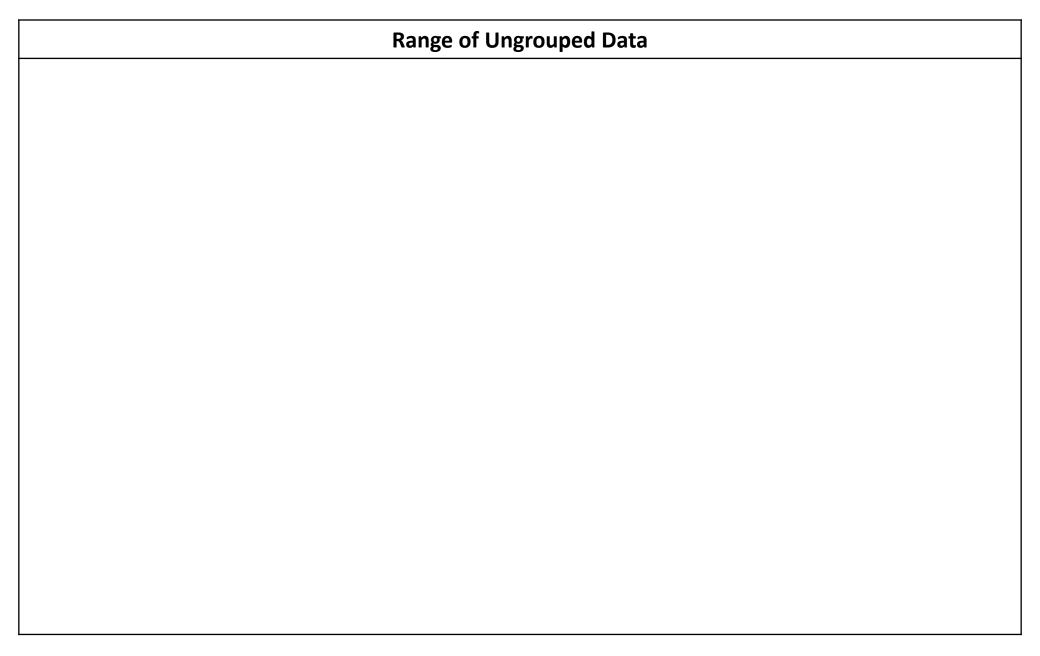
Your Turn

Determine the modal score:

Score	Frequency
0	2
1	3
2	1
3	2
4	2
5	4

Determine the modal score:

Score	Frequency
0	4
1	6
2	2
3	4
4	4
5	8



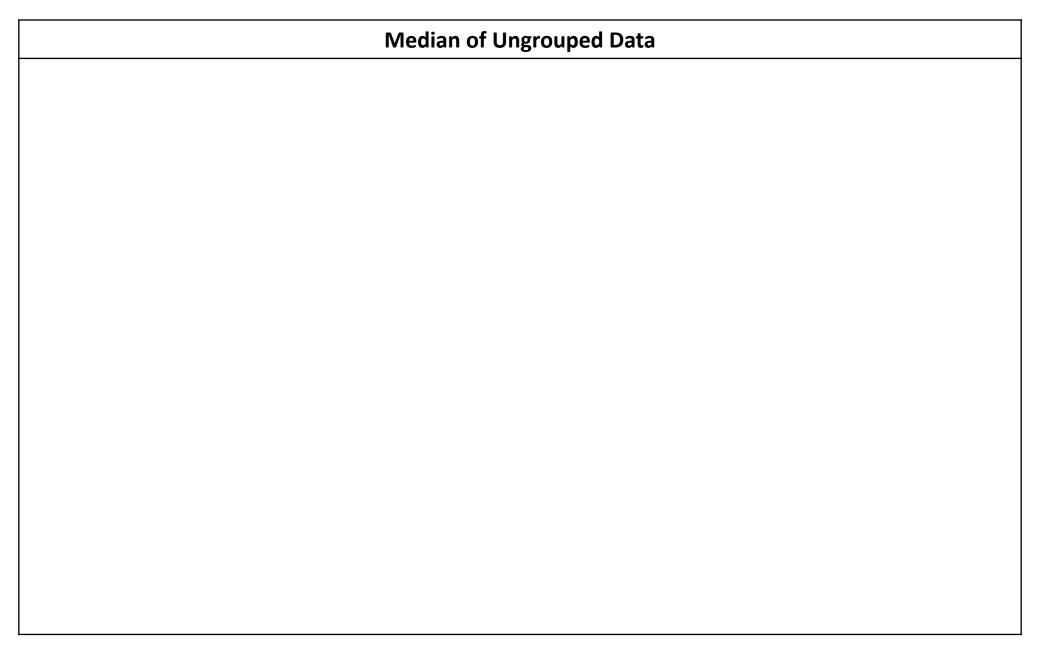
Your Turn

Determine the range of the scores:

Score	Frequency
0	2
1	3
2	1
3	2
4	2
5	4

Determine the range of the scores:

Score	Frequency
0	4
1	6
2	2
3	4
4	4
5	8



Fluency Practice

Number Position of pieces of the of data: median:

Number of pieces of data:	Position of the median:
7	
11	
10	
41	
24	
	8
	3.5
	40
	21.5

Fluency Practice

Number of pets	Frequency	Which pieces of data are in this category?
0	3	1 st 2 nd 3 rd
1	2	4 th 5 th
2	4	

Number of pets	Frequency	Which pieces of data are in this category?
0	5	
1	1	
2	3	

Number of pets	Frequency	Which pieces of data are in this category?
0	2	
1	1	
2	5	

Number of pets	Frequency	Which pieces of data are in this category?
0	1	
1	3	
2	3	

Number of pets	Frequency	Which pieces of data are in this category?
0		1 st 2 nd
1		3rd
2		4 th 5 th 6 th 7 th 8 th
3		9 th 10 th
4		11 th 12 th 13 th

Number of pets	Frequency	Which pieces of data are in this category?
0		1 st
1		2 nd 3 rd 4 th
2		5 th 6 th 7 th 8 th
3		9 th 10 th
4		11 th 12 th

Number of pets	Frequency	Which pieces of data are in this category?
0	21	1 st to 21 st
1	15	22 nd to
2	18	
3	25	
4	32	

1	mber of pets	Frequency	Which pieces of data are in this category?
	0	10	
	1	12	
	2	15	
	3	20	
	4	5	

Number of pets	Frequency	Which pieces of data are in this category?
0	8	
1	9	
2	13	
3	12	
4	9	

Number of pets	Frequency	Which pieces of data are in this category?
0		1 st to 13 th
1		14 th to 29 th
2		30 th to 59 th
3		60 th to 80 th
4		81 st to 92 nd

Your Turn

Calculate the median score:

Score	Frequency		
0	2		
1	3		
2	1		
3	2		
4	2		
5	4		

Calculate the median score:

_			
Frequency			
4			
6			
2			
4			
4			
8			

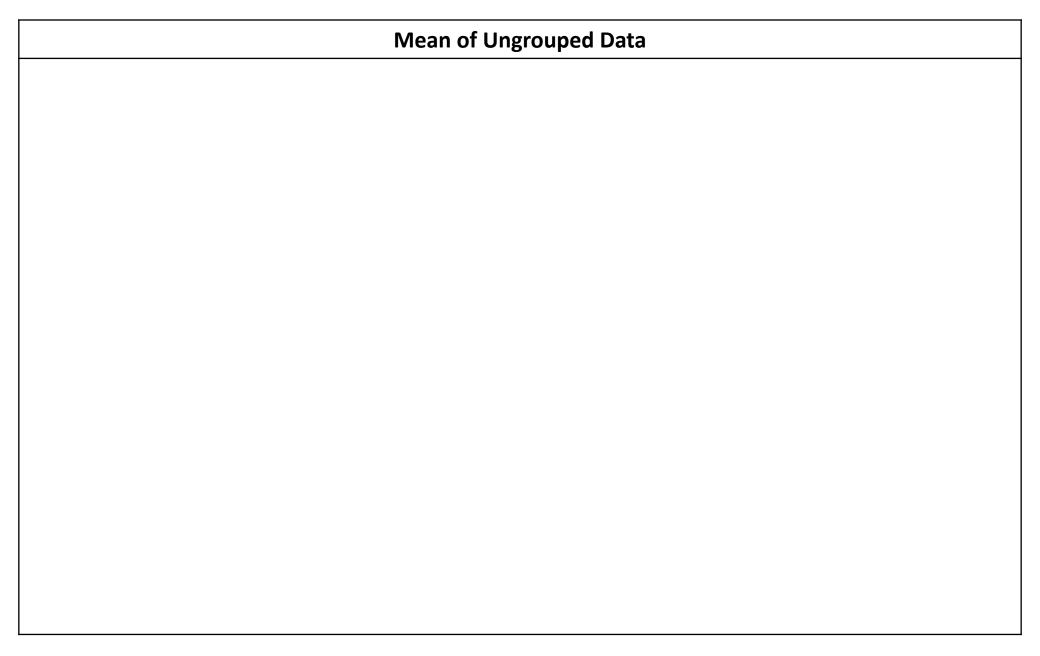
Your Turn

Calculate the median score:

Score	Frequency		
0	2		
1	3		
2	1		
3	2		
4	2		
5	7		

Calculate the median score:

Score	Frequency			
0	9			
1	6			
2	2			
3	4			
4	4			
5	8			



Your Turn

Calculate the mean score:

Score	Frequency		
0	2		
1	3		
2	1		
3	2		
4	2		
5	4		

Calculate the mean score:

Frequency		
4		
6		
2		
4		
4		
8		





Data Set				Frequency Table				
7	7	7	7		Value	Frequ	ency	Value × Frequency
7			8		7	6	<u> </u>	42
8	8	8	8		8	9		72
8					9	5		45
9	9	9	9		Totals	20)	159
ľ	4eaı	า	159		÷	20	=	7.95

I	Data Set				Frequency Table			
4	4	4	4		Value	Frequency	Value × Frequency	
					4	13		
					5	2		
					6	5		
					Totals			
Mean			•	÷	=			

I	Data	Se	Frequency Table					
2	2	2	2		Value	Frequen	су	Value ×
2	3	3	3	_	2			Frequency
3	3	3	3		3			
4	4	4	4		4			
4	4	4	4		Totals	20		
1	1eai	า		•	÷	20 =		

ı	Data Set			Frequency Table			
12	12	12	12	Value	Frequency	Value × Frequency	
12	12	12	12	12		requency	
12	12	12	12	13			
12	14	14	14	14			
14	14	14	14	Totals			
ı	Mean		÷	=			

I	Data Set				Fr	equency	Гable
4	5	5	5		Value	Frequency	Value × Frequency
5	6	6	6		4		
6	6	6	7		5		
					6		
7	7	7	7		7		
7	7	7	7		Totals		
ı	4eaı	า		•	÷	=	

D	Data Set		Frequency Table			
			Value	Frequency	Value × Frequency	
			2.5	8		
			2.6	3		
			2.7			
			2.8	5		
			Totals	20		
M	ean		÷	=		

Data Se	t	Frequency Table				
		Value	Frequency	Value × Frequency		
		8	5			
		9	8			
		10				
		11	6			
		Totals	24			
Mean	•	÷	=			

Data Se	t	Frequency Table			
		Value	Frequency	Value × Frequency	
		3	2		
		4			
		5			
		6	12		
		Totals	24		
Mean		÷	=	5.25	

The table gives information about the numbers of badges gained by the girls in a Guide group.

- a) Write down the mode.
- b) Find the range.
- c) Work out the median
- d) Calculate the mean.

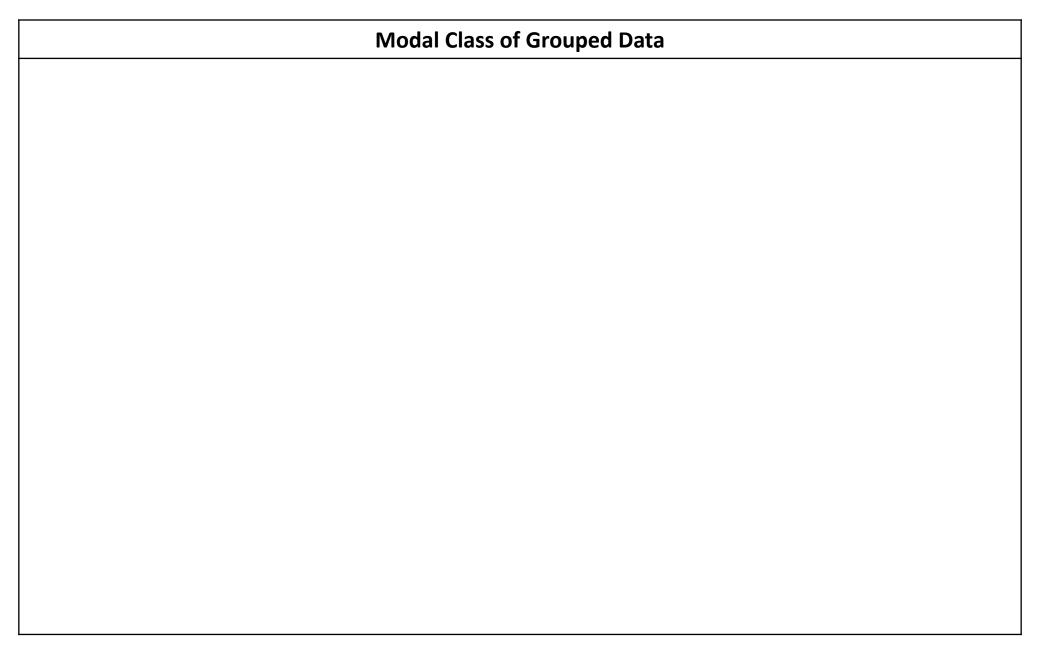
	i
Number of badges	Frequency
0	2
1	8
2	4
3	3
4	5
5	3

Class			Total Frequency (class size)	Most common age (modal age)	Oldest student	Youngest student	Range of ages	Total of all their ages	Mean age	Median age
А	Age 5 6	Frequency 3 7								
В	Age 7 8 9	Frequency 3 9	20							
С	Age 10 11 12 13	Frequency 14	30	13		10	3			
D	Age	Frequency		10 and 11	12		2	108	10.8	

Grouped Frequency Tables

80 people take part in a survey. Their ages are shown in the frequency table. How many respondents are in their thirties?

Age range	Frequency
20 ≤ age < 30	8
30 ≤ age < 40	
40 ≤ age < 50	12
50 ≤ age < 60	16
60 ≤ age < 70	11
70 ≤ age < 80	10
80 ≤ age < 90	9
	80



Your Turn

Determine the modal class interval:

Mass, x (kg)	Frequency
$0 < x \le 10$	5
$10 < x \le 20$	3
$20 < x \le 40$	2
$40 < x \le 46$	6
$46 < x \le 50$	7

Determine the modal class interval:

Mass, x (kg)	Frequency
$0 < x \le 10$	15
$10 < x \le 20$	6
$20 < x \le 40$	4
$40 < x \le 46$	12
$46 < x \le 50$	8



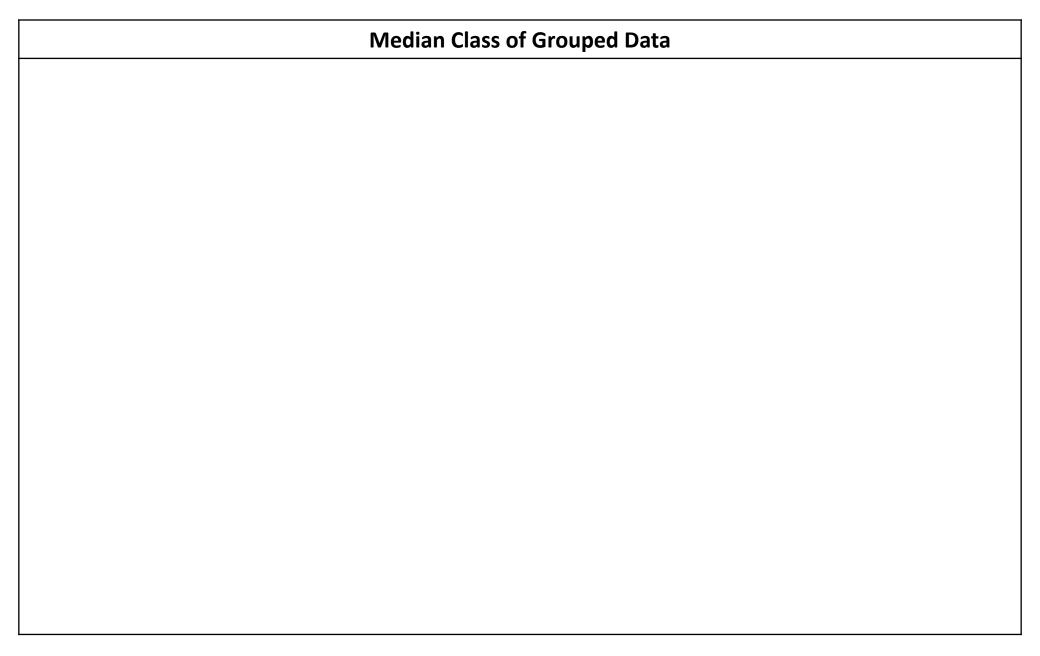
Your Turn

Determine the upper and lower bounds for the range:

Mass, x (kg)	Frequency		
$0 < x \le 10$	5		
$10 < x \le 20$	3		
$20 < x \le 40$	2		
$40 < x \le 46$	6		
$46 < x \le 50$	7		

Determine the upper and lower bounds for the range:

Mass, x (kg)	Frequency		
$10 < x \le 20$	5		
$20 < x \le 30$	3		
$30 < x \le 50$	2		
$50 < x \le 56$	6		
$56 < x \le 60$	7		



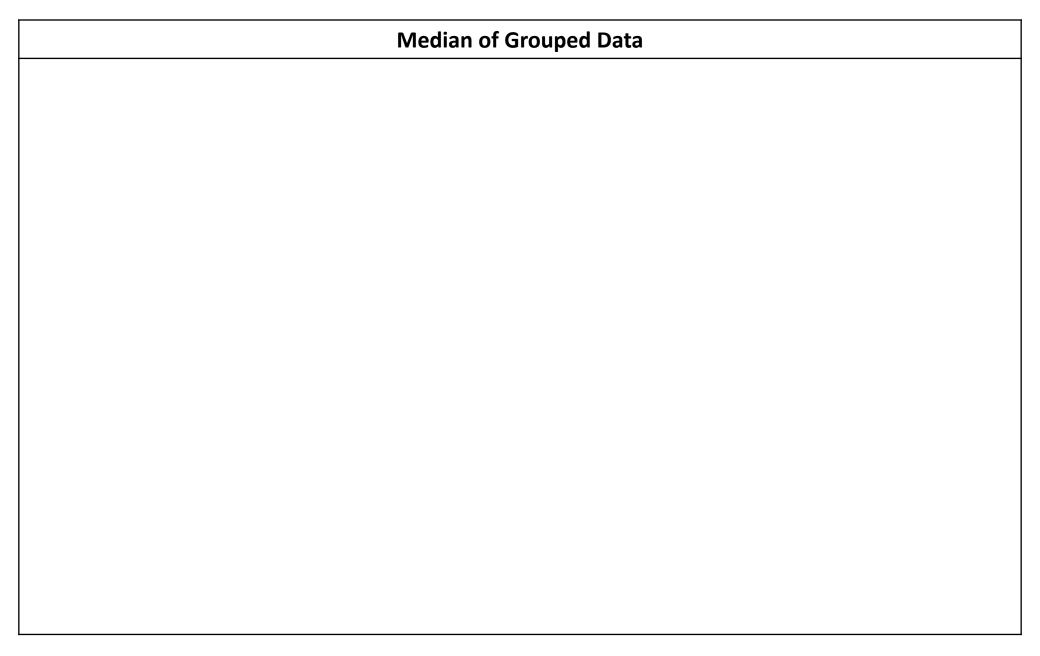
Your Turn

Determine the median class interval:

Mass, x (kg)	Frequency		
$0 < x \le 10$	5		
$10 < x \le 20$	3		
$20 < x \le 40$	2		
$40 < x \le 46$	6		
$46 < x \le 50$	7		

Determine the median class interval:

Mass, x (kg)	Frequency		
$0 < x \le 10$	15		
$10 < x \le 20$	6		
$20 < x \le 40$	4		
$40 < x \le 46$	12		
$46 < x \le 50$	8		



Jack collects the heights of 100 flowers and records the data in the table below.

Height (y cm)	Frequency		
$40 < y \le 50$	7		
$50 < y \le 60$	14		
$60 < y \le 70$	59		
$70 < y \le 80$	11		
$80 < y \le 90$	9		

Use interpolation to estimate the median.

Give your answer correct to 1 decimal place.

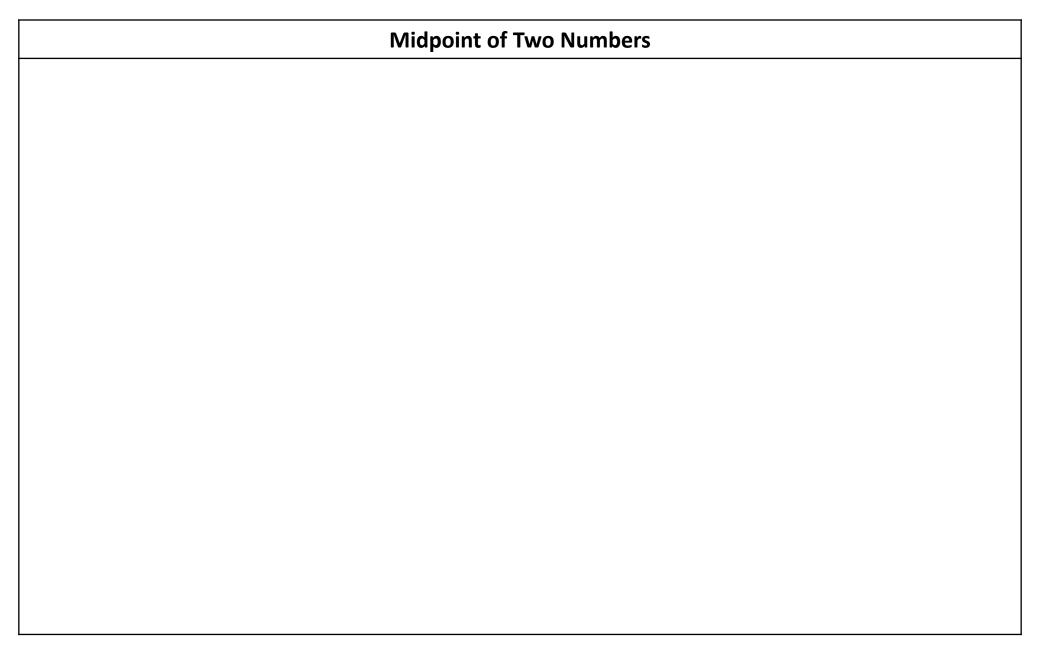
Your Turn

James collects the heights of 80 flowers and records the data in the table below.

Height (x cm)	Frequency		
$35 < x \le 40$	4		
$40 < x \le 45$	9		
$45 < x \le 50$	26		
$50 < x \le 55$	13		
$55 < x \le 60$	8		
$60 < x \le 65$	20		

Use interpolation to estimate the median.

Give your answer correct to 1 decimal place.

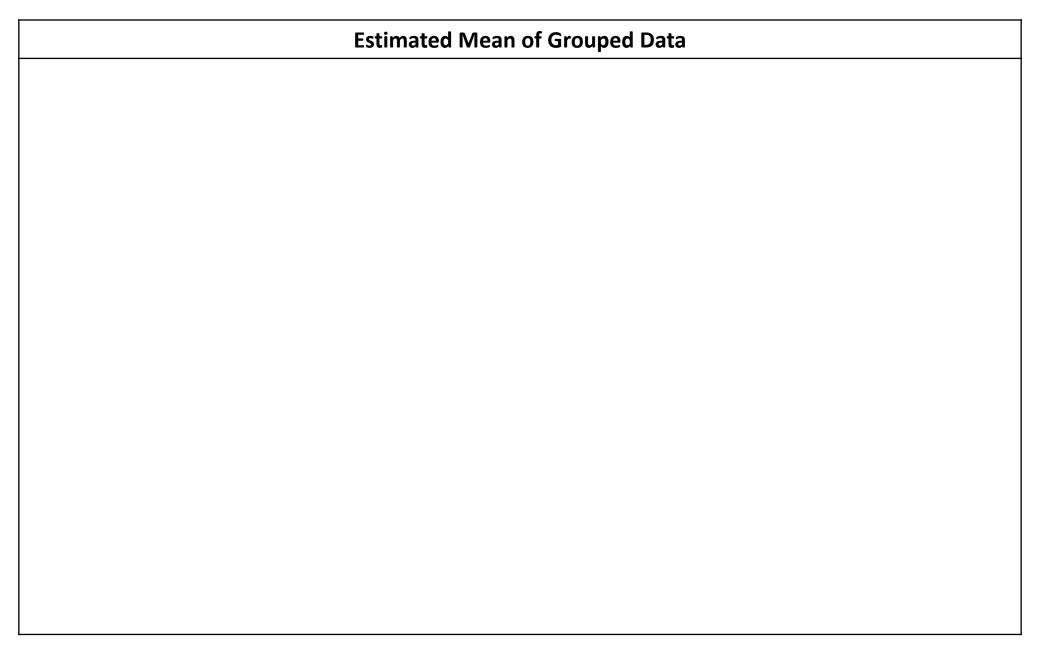


Worked Example		Your T	urn
Numbers	Midpoint	Numbers	Midpoint
40 and 60		40 and 70	

Intelligent Practice

Numbers	Midpoint
1. 8 and 10	
2. 7 and 11	
3. 2 and 16	
4. 22 and 36	
5. 22 and 46	
6. 22 and 47	
7. 22 and 48	
8. 21 and 48	
9. 21 and 47	
10. 42 and 94	

Numbers	Midpoint
11. 142 and 194	
12. 14.2 and 19.4	
13. 7.1 and 9.7	
14. 7 and 9.6	
159.6 and -7	
16 . −9.9 and − 7	
179.9 and - 6.9	
186.9 and 9.9	
19. $-6\frac{3}{4}$ and $9\frac{3}{4}$	
20. $-6\frac{3}{5}$ and $9\frac{3}{4}$	



Your Turn

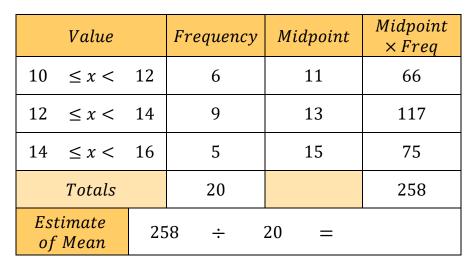
Calculate an estimate for the mean:

Mass, x (kg)	Frequency		
$0 < x \le 8$	3		
$8 < x \le 16$	6		
$16 < x \le 24$	7		
$24 < x \le 32$	4		

Calculate an estimate for the mean:

Mass, x (kg)	Frequency		
$0 < x \le 8$	3		
$8 < x \le 16$	0		
$16 < x \le 24$	7		
$24 < x \le 32$	4		





	Value		Frequency	Midpoint	Midpoint × Freq
20	≤ <i>x</i> <	30	9	25	225
30	≤ <i>x</i> <	40	7	35	
40	≤ <i>x</i> <	50	4	45	
	Totals		20		
	imate Mean		÷	20 =	

	Value		Frequency	Midpoint	Midpoint × Freq
20	≤ <i>x</i> <	24	6	22	
24	≤ <i>x</i> <	28	10		
28	≤ <i>x</i> <	32	5		
32	≤ <i>x</i> <	36	4		
Totals		25			
Estimate of Mean		÷	=		

	Value		Frequency	Midpoint	Midpoint × Freq
5	≤ <i>x</i> <	10	7		
10	≤ <i>x</i> <	15	7		
15	≤ <i>x</i> <	20	8		
20	≤ <i>x</i> <	25	3		
Totals		25			
	Estimate of Mean		÷	=	

Value		Frequency	Midpoint	Midpoint × Freq
100 ≤ <i>x</i> <	120	7		
$120 \le x <$	140	12		
140 ≤ <i>x</i> <	160			
160 ≤ <i>x</i> <	180	2		
Totals		30		
Estimate of Mean		÷	=	

Value		Frequency	Midpoint	Midpoint × Freq
$0 \leq x <$	2			3
2 ≤ <i>x</i> <	4			9
4 ≤ <i>x</i> <	6			40
6 ≤ <i>x</i> <	8			42
Totals		20		
Estimate of Mean		÷	20 =	

Value		Frequency	Midpoint	Midpoint × Freq
$0 \leq x <$				40
≤ <i>x</i> <				240
≤ <i>x</i> <				275
≤ <i>x</i> <	40			
Totals				
Estimate of Mean		÷	40 =	18.25

Value	Frequency	Midpoint	Midpoint × Freq
≤ <i>x</i> <			
≤ <i>x</i> <			
≤ <i>x</i> <		55	1430
≤ <i>x</i> <		65	780
Totals			
Estimate of Mean	÷	50 =	54.2

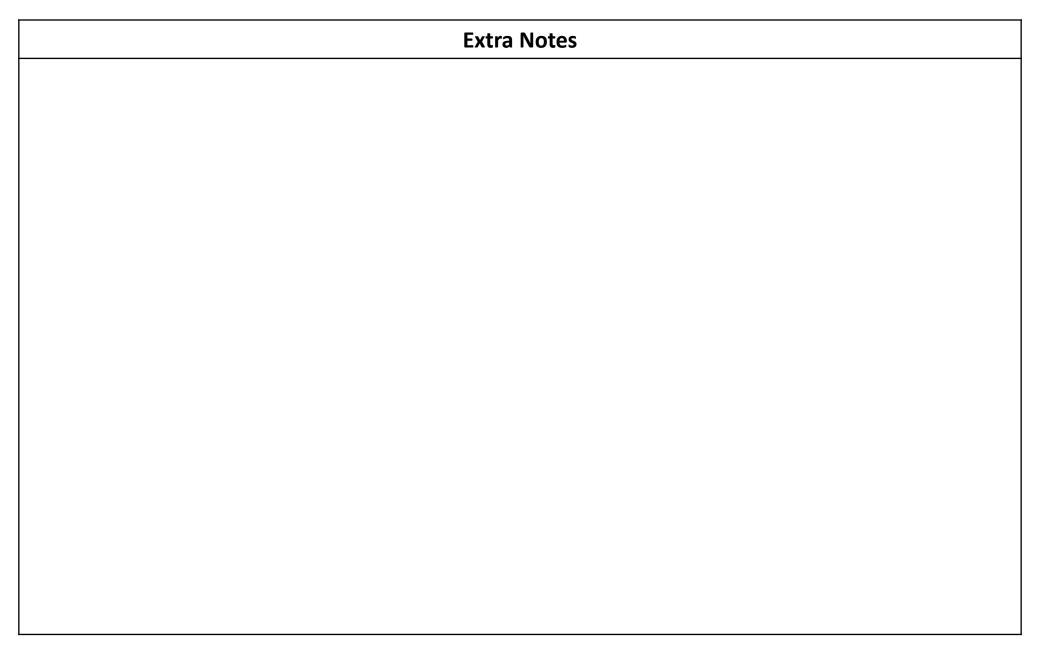
In each table, values are grouped into classes of equal width.

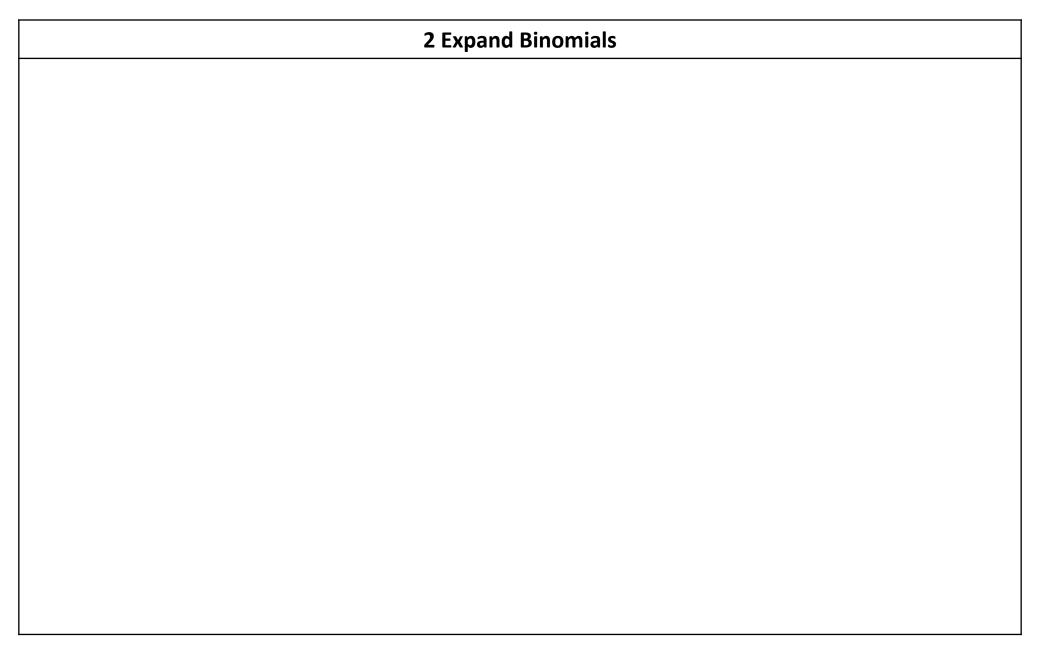
Worked Example

Bob asked each of 40 friends how many minutes they took to get to work. The table shows some information about his results.

- a) Write down the modal class.
- b) Work out the upper and lower bounds for the range.
- c) Work out the class in which the median lies.
- d) Calculate an estimate for the median.
- e) Calculate an estimate for the mean.

Time taken (m minutes)	Frequency
$0 < m \le 10$	3
$10 < m \le 20$	8
$20 < m \le 30$	11
$30 < m \le 40$	9
$40 < m \le 50$	9





Worked Example	Your Turn
Expand and simplify: $(x+2)(x-3)(x-4)$	Expand and simplify: $(x+4)(x-3)(x-2)$

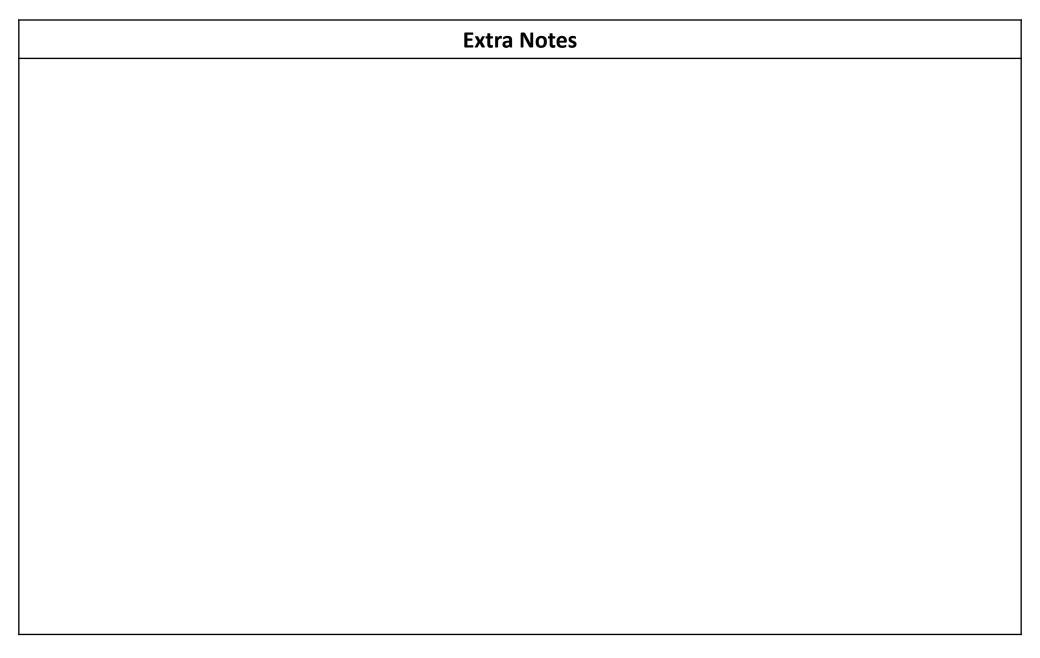
Worked Example	Your Turn
Expand and simplify: $(5x + 2)(7x - 3)(x - 4)$	Expand and simplify: $(5x + 4)(7x - 3)(x - 2)$

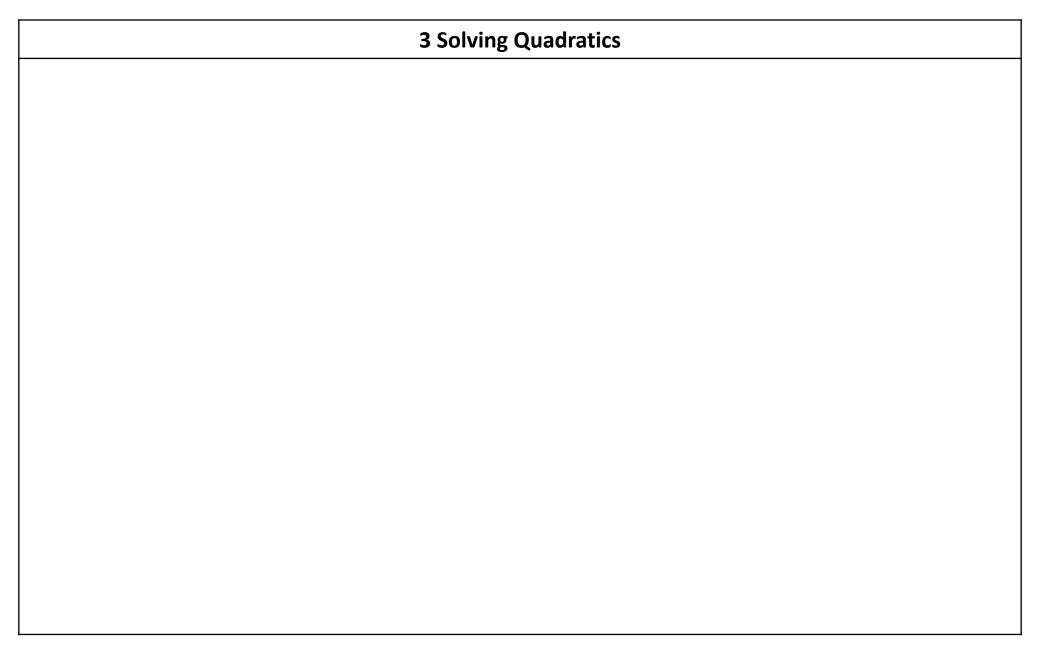
Worked Example	Your Turn
Expand and simplify: $(3x-2)^3$	Expand and simplify: $(4x-3)^3$



Expanded	Factorised	Expanded	Factorised
2x + 8	2(x+4)	$x^2 - 7x + 10$	Expression
	3(x-2)		(x-6)(x+4)
	x(x+7)		(x+7)(x-7)
5x + 35		$x^2 + 2x - 15$	
8x - 12		$x^2 - 25$	
	2x(x-5)		(2x+1)(x+5)
$x^2 - x$		$x^2 - x - 6$	
	5x(3-x)	$x^2 + 3x$	
$10x^2 + 2x$			(3x-1)(x-2)
6x + 9y		$4x^2 - 25$	
	4xy(x+2)		$(x+5)^2$
$6xy - 4y^2$		$7x^2 + 10x + 3$	
	(x+2)(x+3)		$(3x-1)^2$
	(x+5)(x-3)	$4x^2 + 4x + 1$	
$x^2 + 8x + 15$		$5x^2 - 14x - 3$	
$x^2 + 3x + 2$			$(x-2)^3$







Multiplication by Zero

$$(a-3)\times 2=0$$

$$(a-7)\times a=0$$

$$a \times a = 0$$

$$(a+5)(a-3)=0$$

$$a^2 + 6a + 8 = 0$$

$$a^2 + 8a + 16 = 0$$

Your Turn
What values of x satisfy the equation $(x + 6)x = 0$?

Worked Example	Your Turn
What values of x satisfy the equation $(x - 9)(x + 5) = 0$?	What values of x satisfy the equation $(x + 6)(x - 5) = 0$?

Worked Example	Your Turn
Solve the equation $(2x-3)(3x+1) = 0$	Solve the equation $(3x + 2)(2x - 1) = 0$

Worked Example	Your Turn
Solve the equation $x^2 + 2x - 8 = 0$	Solve the equation $x^2 + 2x - 15 = 0$

Worked Example	Your Turn
Solve the equation $x^2 - 49 = 0$	Solve the equation $x^2 - 64 = 0$

Worked Example	Your Turn
Solve the equation $3x^2 + 2x = 0$	Solve the equation $2x^2 - 3x = 0$

Worked Example	Your Turn
Solve the equation $x^2 - 4x + 4 = 0$	Solve the equation $x^2 + 14x + 49 = 0$

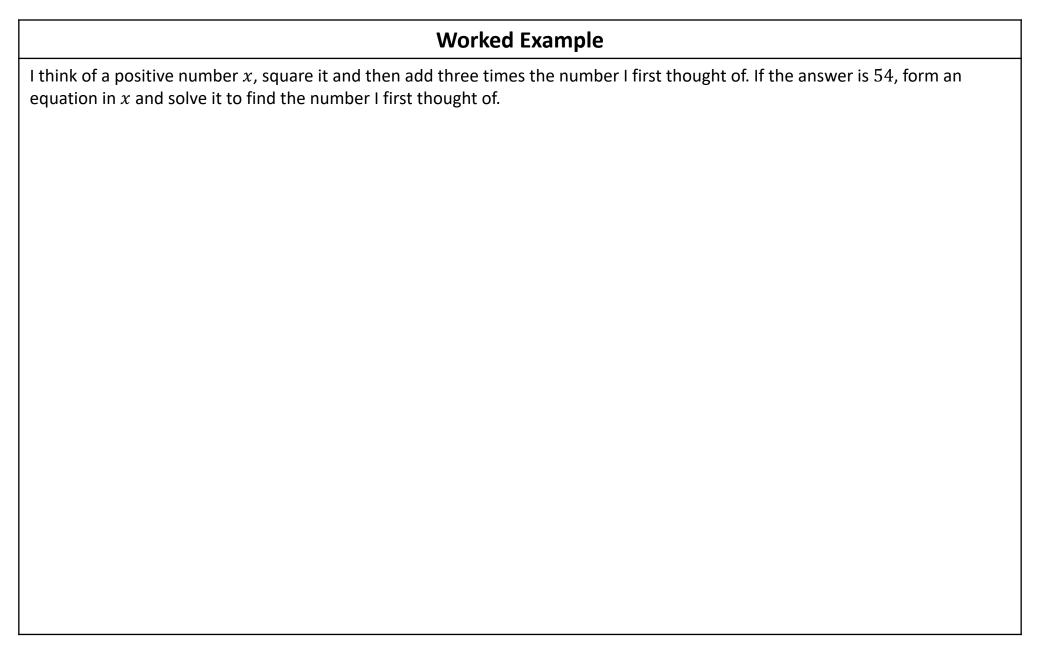
Your Turn
Solve the equation $5x^2 + 7x - 6 = 0$

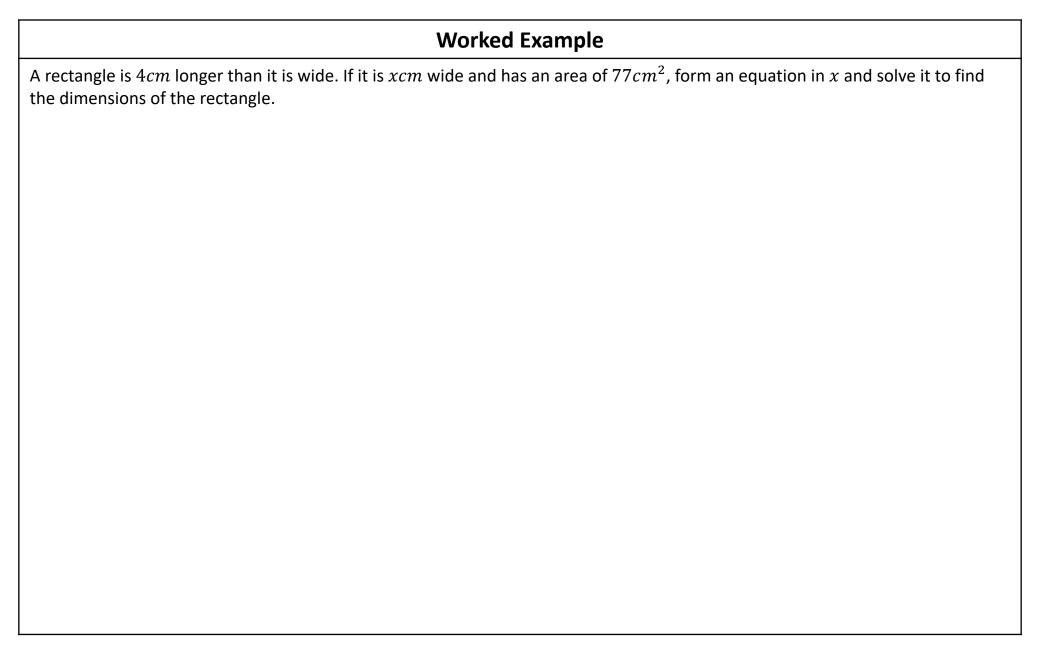
Your Turn
Solve the equation $16x^2 - 81 = 0$

Your Turn
Solve the equation $x^2 = 2x + 3$

Worked Example	Your Turn
Solve the equation $12x^2 + 10x - 12 = 0$	Solve the equation $18x^2 - 15x - 18 = 0$

Worked Example	Your Turn
Solve the equation $x(x-2) = 15$	Solve the equation $(x-3)(x+2) = 6$





Worked Example		
The sum of two numbers is 13 and the sum of their squares is 97. Find the numbers.		

Worked Example	Your Turn
Solve: a) $x^2 - 28 = 53$	Solve: a) $\frac{\sqrt{x}}{3} = 4$
b) $5\sqrt{x} = 20$	b) $24 + x^3 = 88$

Quadratic Formula

a general quadratic equation can always be written:

$$ax^2 + bx + c = 0$$

the solutions to a general quadratic equation are:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

a is the number in front of the x^2

b is the number in front of the *x*

c is the (constant) number

Worked Example	Your Turn
Write down the values of	Write down the values of
a, b and c in:	a, b and c in:
a) $5x^2 + 2x - 3 = 0$	a) $5x^2 - 2x + 3 = 0$
b) $x^2 + 2x - 3 = 0$	b) $x^2 - 2x + 3 = 0$
c) $x^2 + 2x = 4x - 3$	c) $x^2 - 2x = -4x + 3$

Questions	а	b	С
$3x^2 + 5x + 1 = 0$			
$0 = 3x^2 + 5x + 1$			
$0 = 3x^2 + 5x + 2$			
$3x^2 + 4x + 2 = 0$			
$0 = 3x^2 + 4x - 2$			
$3x^2 - 4x + 2 = 0$			
$x^2 - 4x + 2 = 0$			
$x^2 + 2 - 4x = 0$			
$1 + 2x - 4x^2 = 0$			
$1 + 2x = 4x^2$			

Intelligent Practice

Questions	а	b	с
$2x = 4x^2 + 1$			
$1 = 4x^2 + 2$			
$4x^2 + 2x = 0$			
$4x^2 + 2 = 0$			
$2(2x^2 + 1) = 0$			
$-2(2x^2 + 1) = 0$			
$-2(2x^2 + 1) = 2x$			
$-2(2x^2+1) = 2x+2$			
$-2(2x^2+1) = x^2 + 2x + 2$			
$-2(2x^2 + x + 1) = x^2 + 2x + 2$			

Discriminant

The expression $b^2 - 4ac$ in the quadratic formula is called the discriminant, because it can "discriminate" between the possible types of answer:

- When $b^2 4ac$ is positive, we get two real solutions
- When $b^2 4ac$ is zero, we get just one real solution (both answers are the same)
- When $b^2 4ac$ is negative, we get a pair of complex solutions

Worked Example	Your Turn
Given that $a=5, b=6, c=-7$ work out the value of b^2-4ac	Given that $a=-6$, $b=7$, $c=8$ work out the value of b^2-4ac

Worked Example	Your Turn
Use the formula to solve the equation $x^2 - 9x - 2 = 0$ giving your answers correct to two decimal places.	Use the formula to solve the equation $x^2 - 2x - 9 = 0$ giving your answers correct to two decimal places.

Worked Example	Your Turn
Use the formula to solve the equation $3x^2 + 7x - 2 = 0$ giving your answers correct to two decimal places.	Use the formula to solve the equation $3x^2 - 9x + 2 = 0$ giving your answers correct to two decimal places.

Your Turn
Solve the equation $7x^2 = 4x + 1$ giving your answers correct to two decimal places.





Quadratic Equation	a, b and c	b^2-4ac	$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$	Solutions to 3sf
$x^2 + 5x + 1 = 0$	a = 1, b = 5, c = 1	$5^2 - 4 \times 1 \times 1$ $= 21$	$x = \frac{-5 + \sqrt{21}}{2}$	$x = \frac{-5 - \sqrt{21}}{2}$	
$2x^2 + 5x + 1 = 0$	a = 2, b = 5, c = 1	$5^2 - 4 \times 2 \times 1$ $= 17$			
$2x^2 - 5x + 1 = 0$	a = 2, b = -5, c = 1	$(-5)^2 - 4 \times 2 \times 1$ $= 17$	$x = \frac{5 + \sqrt{17}}{2}$		
$x^2 - 7x + 3 = 0$					
$2x^2 - 7x + 3 = 0$					
$5x^2 + x - 2 = 0$					
	a = 3, b = 5, c = 2				
			$x = \frac{-9 + \sqrt{89}}{4}$	$x = \frac{-9 - \sqrt{89}}{4}$	

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- 1) Identify a, b & c and substitute into the quadratic formula.
- 2) **Remember!** The square root of the discriminant can be positive or negative You must complete the formula for both!
- 3) Give your answers to 2 decimal places

$x^2 + 5x + 3 = 0$	a = 1 $b = 5$ $c = 3$	$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$	$x = \frac{-() \pm \sqrt{()}}{()}$	$x = \frac{-(\)-(\)}{(\)}$ $x = \frac{-(\)+(\)}{(\)}$	$ \begin{array}{c} x = -0.70 \\ \text{or} \\ x = \end{array} $
$x^2 + 6x - 2 = 0$	$\begin{vmatrix} a = 1 \\ b = \\ c = \end{vmatrix}$	$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$	$x = \frac{-() \pm \sqrt{()}}{()}$	$x = \frac{-(\)-(\)}{(\)}$ $x = \frac{-(\)+(\)}{(\)}$	x = 0.32 or $x =$
$2x^2 + 8x + 3 = 0$	a = b = c =	$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$	$x = \frac{-() \pm \sqrt{()}}{()}$		
$4x^2 + 3x - 6 = 0$		$x = \frac{-(\) \pm \sqrt{(\)^2 - 4(\)(\)}}{2(\)}$			
$5x^2 - 4x - 8 = 0$					

2) Use the quadratic formula to solve these equations. Give your answers to 2 decimal places.

a)
$$2x^2 + 9x = -3$$

b)
$$4x^2 - 3 = 7x$$

c)
$$5x = -8 + 5x^2$$



1 Complete the table below.

Q	Equation	а	b	С	Substitution	Simplification	Exact Answer	Answers to 3sf
Ex	$x^2 + 5x + 1 = 0$	1	5	1	$x = \frac{-5 \pm \sqrt{5^2 - 4(1)(1)}}{2(1)}$	$x = \frac{-5 \pm \sqrt{25 - 4}}{2}$	$x = \frac{-5 \pm \sqrt{21}}{2}$	x = -4.79 & x = -0.209
1	$x^2 + 6x + 1 = 0$							
2	$x^2 + 6x + 2 = 0$							
3	$x^2 + 7x + 2 = 0$							
4	$x^2 + 7x - 2 = 0$							
5	$x^2 - 7x - 2 = 0$							
6	$-x^2 - 7x - 2 = 0$							
7	$-x^2 - 7x + 2 = 0$							
8	$2 - 7x - x^2 = 0$							

9		1	7	3				
10		1	7	4				
11		1	-7	4				
12					$x = \frac{-(-7)\pm\sqrt{(-7)^2-4(-1)(4)}}{2(-1)}$			
13						$x = \frac{-(-8) \pm \sqrt{64 + 16}}{2(-1)}$		
14		-1					$x = \frac{-8 \pm \sqrt{84}}{-2}$	
15	$\frac{1}{2}x^2 + 4x + 5 = 0$	1/2						
16	$\frac{1}{2}(x^2 + 4x + 5) = 0$							
17	$\frac{1}{3}(x^2 + 4x + 5) = 0$							
18	$\frac{2x^2 + 4x + 5}{3} = 0$							

2 Complete the table below.

2 Co	mplete the table below.		ı					
Q	Equation	а	b	С	Substitution	Simplification	Exact Answer	Answers to 3sf
Ex	$2x^2 + 5x + 1 = 0$	2	5	1	$x = \frac{-5 \pm \sqrt{5^2 - 4(2)(1)}}{2(2)}$	$x = \frac{-5 \pm \sqrt{25 - 8}}{4}$	$x = \frac{-5 \pm \sqrt{17}}{4}$	x = -2.28 & x = -0.219
1	$2x^2 + 6x + 1 = 0$							
2	$2x^2 + 6x + 2 = 0$							
3	$2x^2 + 6x - 2 = 0$							
4	$2x^2 - 6x + 2 = 0$							
5	$2x^2 - 6x - 2 = 0$							
6	$3x^2 - 6x - 2 = 0$							
7	$4x^2 - 6x - 2 = 0$							
8	$4x^2 - 6x + 2 = 0$							

Fill	in	the	Ga	ps
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9	$2 - 6x + 4x^2 = 0$				
10	$2 - 6x - 4x^2 = 0$				
11	$1 - 3x - 2x^2 = 0$				
12	$\frac{1}{2} - \frac{3}{2}x - x^2 = 0$				
13	$\frac{1}{6} - \frac{1}{2}x - \frac{1}{3}x^2 = 0$				
14	$\frac{1}{3}x^2 + \frac{1}{2}x - \frac{1}{6} = 0$				
15	$\frac{1}{3}x^2 + \frac{1}{2}x - \frac{1}{6} = 1$				
16	$\frac{1}{3}x^2 + \frac{1}{2}x - \frac{1}{6} = x$				
17	$\frac{1}{3}x^2 + \frac{1}{2}x - \frac{1}{6} = x^2$				
18	$\frac{1}{3}x^2 + \frac{1}{2}x - \frac{1}{6} = -x^2$				

