

Quadratics

Name

'Do Now' Tracker

①

Sequences

1	2	3
4	5	6

②

Straight Line Graphs

1	2	3
4	5	6

③

Solving Equations

1	2	3
4	5	6

④

Area and Perimeter

1	2	3
4	5	6

① Find the n th term of the sequence
 $-8, 2, 16, 34, \dots$

1

Find an equation of the line
perpendicular to $y = 3x - 2$ that
passes through the point $(2, 1)$.

②



③ Solve for x :
$$x + 4 = \frac{x - 5}{3}$$

Draw an unusual triangle with an
area of 12 cm^2 .

④



① Find the n th term of the sequence
 $-2, -2, 0, 4, \dots$

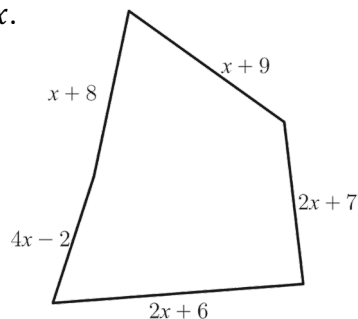
2

Find the equation of the line passing
through the points $(3, -1)$ and $(-1, -3)$.

②



③ This shape has perimeter 68 cm .
Find the value of x .



Draw a triangle that someone might
think has an area of 12 cm^2 , but
doesn't.

④



① Find the n th term of the sequence
 $0, 1, 3, 6, \dots$

3

② Find an equation of the line
perpendicular to $y = 13x - 4$ that
passes through the point $(-4, 1)$.



③ Solve for x :
 $3 = \frac{x}{2} - 6$

④ Draw a trapezium with an area of 12 cm^2



① Find the n th term of the sequence
 $-1.5, 1.5, 6.5, 13.5, \dots$

4

② A line passes through the points
 $(-2, 5)$ and $(3, -4)$.

Find the equation of the line.



③ Solve for x :
 $\frac{7x - 8}{5} = \frac{2x + 5}{4}$

④ Draw a trapezium with an area of 12 cm^2 .

The height must be a decimal.



① What number appears exactly once in the sequence
50, 37, 26, 17, ...



5

Find an equation of the line parallel to $y = \frac{3}{4}x + 2$ that passes through the point $(-4, 4)$.

②



③ Solve for x :
$$\frac{x + 2}{x + 3} = 4$$



Draw a trapezium with an area of 12 cm^2 .
All the lengths given must be prime numbers.

④



① What is the largest number in the sequence
1, 14, 25, 35, ...



6

Find an equation of the line parallel to $y = 4x + 2$ that passes through the point $(-5, 1)$.

②

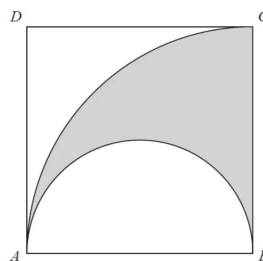


③ Solve for x :
$$\frac{5}{3x + 1} = 12$$



Show that $\frac{\pi}{8}$ of the square is shaded.

④



Task 1: Expanding and Factorising Single Brackets

	Factorised	Expanded		Factorised	Expanded
a	$4(x - 6)$		n		$2x^4 + 6x^3 + 8x^2$
b		$4x - 6$	o		$2x^2 + 6x^3 + 8x^4$
c	$x(x - 6)$		p	$x(y + 3)$	
d		$x^2 + 6x$	q	$2x(y + 4)$	
e	$4(2x - 6)$		r		$12xy + 15x$
f		$42x - 6$	s		$12x^2 + 15xy$
g	$x(2x - 6)$		t		$12x^2y + 15xy$
h	$2x(x - 6)$		u	$5x(x - 3y + 2z)$	
i		$6x^2 + 10x$	v		$18z^2 - 12yz$
j		$6x^3 + 10x^2$	w		$6pq - 5p^2q^2$
k	$x(x^2 + 3x + 4)$		x		$5x^2y - xy^2$
l		$2x^2 + 6x + 8$	y		$x^3y^3 - x^2y^2 + xy$
m	$2x(x^2 + 3x + 4)$		z		$91x^2y - 119xy^2$

Task 2: Introducing Areas and Grids

	24	32	61	29			
17		11		23		12	
Original:							
Brackets:	$(10 + 7)(20 + 4)$						
Result:							

Find four different ways to calculate 23×37

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Task 3: Expanding Double Brackets with Grids

Brackets:	$(x + 5)(x + 2)$	$(x + 5)(x - 2)$	$(x - 5)(x + 2)$	$(x - 5)(x - 2)$																																				
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Brackets:	$(x + 2)(x - 2)$	$(x + 5)(x - 5)$																																						
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Expanded:																																								
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Brackets:	$(x + 2)^2$	$(x - 2)^2$	$(x + 5)^2$																																					
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Task 4 Match them up!

A: $(x + 20)(x - 6)$	B: $(x + 20)(x + 6)$	C: $(x + 6)(x - 4)$	D: $(x - 6)(x + 4)$
E: $(x + 6)(x + 8)$	F: $(x - 8)(x + 6)$	G: $(x + 8)(x - 6)$	H: $(x + 10)(x + 12)$
I:	J: $(x + 24)(x + 2)$	K:	L: $(x - 10)(x + 12)$

	$x^2 + 14x + 48$
A	$x^2 + 14x - 120$
	$x^2 + 2x - 24$
	$x^2 + 2x - 48$

	$x^2 + 26x + 48$
L	
	$x^2 - 2x - 24$

	$x^2 + 26x + 120$
I	$x^2 + 26x - 120$
	$x^2 + 22x + 120$
	$x^2 + 22x - 48$

Task 5 Expanding and Factorising Double Brackets - Variation Grids

$(x + 14)(x + 1)$	$x(x + 15)$	$(x + 16)(x - 1)$	$(x + 17)(x - 2)$	$(x + 18)(x - 3)$
$x^2 + 15x + 14$				
$x(x + 6)$	$(x + 7)(x - 1)$	$(x + 8)(x - 2)$	$(x + 9)(x - 3)$	
$(x + 2)(x - 2)$	$(x + 3)(x - 3)$	$(x + 4)(x - 4)$		
$x(x - 6)$	$(x + 1)(x - 7)$			
$(x - 1)(x - 14)$				

$x^2 + 7x + 12$	$x^2 + 6x + 9$	$x^2 + 5x + 6$	$x^2 + 4x + 3$	$x^2 + 3x$
$x^2 + x - 12$	$x^2 - 9$	$x^2 - x - 6$		
$x^2 - x - 12$	$x^2 - 9$			
$x^2 - 7x + 12$				

Task 6: Expanding More Double Brackets with Grids

Brackets:	$(2x + 3)(3x + 5)$	$(4x + 5)(2x + 1)$																												
Grid:	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px; text-align: center;">5x</td><td style="width: 50px; height: 50px; text-align: center;">10x²</td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px; text-align: center;">2</td><td style="background-color: #cccccc;"></td><td style="width: 50px; height: 50px; text-align: center;">6</td></tr> </table>	×			5x	10x ²		2		6
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Brackets:	$(2x + 5)(3x - 4)$	$(3x + 7)(3x - 5)$																												
Grid:	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px; text-align: center;">2x</td><td style="width: 50px; height: 50px; text-align: center;">1</td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px; text-align: center;">8x</td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px; text-align: center;">-6x</td><td style="background-color: #cccccc;"></td></tr> </table>	×	2x	1		8x			-6x	
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	-6x																													
Expanded:																														
Simplified:			$10x^2 - 11x - 6$																											

Brackets:	$(2x + 5)^2$	$(2x - 5)(2x + 5)$																												
Grid:	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×								
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Expanded:																														
Simplified:			$4x^2 - 20x + 25$																											

Brackets:	$(x + y)(x + 2y)$	$(2x + y)(3x - y)$	$(4x - 3y)^2$																											
Grid:	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </table>	×									<table border="1" style="border-collapse: collapse; width: 100%;"> <tr><td style="text-align: center;">×</td><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px; text-align: center;">-3y</td></tr> <tr><td style="width: 50px; height: 50px; text-align: center;">4x</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td style="width: 50px; height: 50px;"></td><td style="width: 50px; height: 50px; text-align: center;">-12xy</td><td style="width: 50px; height: 50px; text-align: center;">9y²</td></tr> </table>	×		-3y	4x				-12xy	9y ²
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Expanded:																														
Simplified:			$x^2 + 5xy + 6y^2$																											

Task 7 Match them up!

A: $(x + 1)(28x + 45)$	B: $(x + 3)(28x + 15)$	C: $(x + 5)(28x + 9)$	D:
E: $(2x + 1)(14x + 45)$	F: $(2x + 3)(14x + 15)$	G:	H: $(2x - 3)(14x - 15)$
I: $(4x + 1)(7x + 45)$	J:	K: $(4x + 5)(7x + 9)$	L: $(4x - 5)(7x - 9)$

J	$28x^2 + 81x + 45$
	$28x^2 + 104x + 45$

	$28x^2 + 72x + 45$
G	$28x^2 + 88x + 45$
	$28x^2 + 149x + 45$

	$28x^2 + 73x + 45$
	$28x^2 + 99x + 45$
	$28x^2 + 187x + 45$
D	$28x^2 - 73x + 45$

Task 8 Expanding and Factorising Double Brackets - Variation Grids

$(x - 5)(6x + 31)$	$(x - 1)(6x + 7)$	$x(6x + 1)$	$(x + 1)(6x - 5)$	$(x + 5)(6x - 29)$
$(2x - 5)(6x + 17)$	$(2x - 1)(6x + 5)$	$2x(6x + 2)$	$(2x + 1)(6x - 1)$	$12x^2 + 4x - 65$
$(3x - 1)(6x + 13)$	$(3x - 1)(6x + 5)$	$3x(6x + 3)$		
			$18x^2 + 9x + 1$	$18x^2 + 9x - 35$

$2x^2 - 11x + 12$	$2x^2 + 11x + 12$	$4x^2 - 11x + 6$	$4x^2 + 11x + 6$
$3x^2 - 14x + 8$	$3x^2 + 14x + 8$	$3x^2 - 10x + 8$	$3x^2 + 10x + 8$
$6x^2 - 11x + 4$	$6x^2 + 11x + 4$	$12x^2 - 11x + 2$	$12x^2 + 11x + 2$
$8x^2 - 14x + 3$	$8x^2 + 14x + 3$		

$8x^2 + 22x + 15$	$8x^2 - 2x + 15$	$8x^2 + 2x + 15$	$8x^2 - 22x + 15$
$8x^2 + 26x + 15$	$8x^2 - 14x + 15$	$8x^2 + 14x + 15$	$8x^2 - 26x + 15$

Task 9 Difference of Two Squares

Expand and Simplify			
a. $(x - 2)(x + 2)$		d. $(3x - 4)(3x + 4)$	
b. $(x + 3)(x - 3)$		e. $(x + y)(x - y)$	
c. $(2x + 5)(2x - 5)$		f. $(2x + 3y)(2x - 3y)$	

Factorise			
a. $x^2 - 25$		j. $0.64 - 0.25d^2$	
b. $9x^2 - 4$		k. $(x - 2)^2 - 9$	
c. $36x^2 - 25y^2$		l. $x^2y^4 - 36$	
d. $49a^2 - b^2$		m. $18x^2 - 2$	
e. $\frac{1}{4}a^2 - 4b^2$		n. $320 - 20y^2$	
f. $p^2 - \frac{1}{9}q^2$		o. $(n + 2)^2 - (n + 1)^2$	
g. $(mn)^2 - 9$		p. $32m^2n - 50n^3$	
h. $\frac{1}{4}x^2 - 16$		q. $2\frac{1}{4}x^2 - 5\frac{4}{9}$	
i. $a^4 - 16$		r. $9(g + 2)^2 - 4(g - 3)^2$	

Calculate cleverly			
a. $98^2 - 2^2$		b. $91^2 - 9^2$	
c. $88^2 - 12^2$		d. $104^2 - 4^2$	
e. $999^2 - 1^2$		f. $991^2 - 9^2$	
g. 99×101		h. 67×73	
i. 9.5×10.5		j. 199^2	
k. $2.4^2 - 1.4^2$		l. $87.7^2 - 12.3^2$	
m. $65.8^2 - 34.2^2$		n. $16.5^2 - 3.5^2$	
o. $\left(6\frac{7}{10}\right)^2 - \left(3\frac{3}{10}\right)^2$		p. $\left(8\frac{4}{5}\right)^2 - \left(1\frac{1}{5}\right)^2$	
q. $\left(5\frac{3}{4}\right)^2 - \left(4\frac{1}{4}\right)^2$		r. $4.\dot{6}^2 - 1.\dot{6}^2$	
s. $\left(2\frac{3}{4}\right)^2 - \left(1\frac{1}{4}\right)^2$		t. $\left(\frac{23}{6}\right)^2 - \left(2\frac{1}{6}\right)^2$	
u. $4.4^2 - \left(\frac{3}{5}\right)^2$		v. $0.6\dot{1} \times 0.7\dot{2}$	