Exercise 7:04

Foundation Worksheet 7:04

Factorising trinomials

1 Which two integers:
- **a** add to give 4?
- **b** multiply to give 5?

2 Factorise:
- **a** $m^2 + 8m + 9$
- **b** $n^2 - 3n + 2$

1 Factorise each of these trinomials.

a $x^2 + 4x + 3$	**b** $x^2 + 3x + 2$	**i** $x^2 + 9x + 18$
c $x^2 + 6x + 5$	**d** $x^2 + 7x + 6$	**l** $x^2 + 13x + 36$
e $x^2 + 9x + 20$	**f** $x^2 + 10x + 25$	**o** $x^2 - 7x + 12$
g $x^2 + 12x + 36$	**h** $x^2 + 10x + 21$	**r** $x^2 + x - 12$
j $x^2 + 14x + 40$	**k** $x^2 + 15x + 54$	**u** $x^2 - x - 2$
m $x^2 - 4x + 4$	**n** $x^2 - 12x + 36$	**x** $x^2 - x - 56$
p $x^2 - 9x + 20$	**q** $x^2 + 2x - 3$	
s $x^2 + 4x - 12$	**t** $x^2 + 7x - 30$	
v $x^2 - 10x - 24$	**w** $x^2 - 7x - 30$	

2 Factorise:

a $a^2 + 6a + 8$	**b** $m^2 + 9m + 18$	**c** $y^2 + 13y + 42$
d $p^2 + 7p + 12$	**e** $x^2 + 12x + 20$	**f** $n^2 + 17n + 42$
g $s^2 + 21s + 54$	**h** $a^2 + 18a + 56$	**i** $x^2 - 3x - 4$
j $a^2 - 2a - 8$	**k** $p^2 - 5p - 24$	**l** $y^2 + y - 6$
m $x^2 + 7x - 8$	**n** $q^2 + 5q - 24$	**o** $m^2 + 12m - 45$
p $a^2 + 18a - 63$	**q** $y^2 + 6y - 55$	**r** $x^2 - 2x + 1$
s $k^2 - 5k + 6$	**t** $x^2 - 13x + 36$	**u** $a^2 - 22a + 72$
v $p^2 + 22p + 96$	**w** $q^2 - 12q - 45$	**x** $m^2 - 4m - 77$

3 Factorise by first taking out a common factor (see example 5).

a $2x^2 + 6x + 4$	**b** $3x^2 - 6x - 9$	**c** $5x^2 - 10x - 40$
d $2x^2 + 16x + 32$	**e** $3x^2 - 30x - 33$	**f** $3x^2 + 21x + 36$
g $4a^2 - 12a - 40$	**h** $2n^2 + 8n + 6$	**i** $5x^2 - 30x + 40$
j $3x^2 - 21x + 36$	**k** $3a^2 - 15a - 108$	**l** $5x^2 + 15x - 350$

fun spot

7:04

Fun Spot 7:04 | How much logic do you have?

See if you can solve the three problems below.

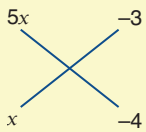
1 What is the next letter in this sequence?
O, T, T, F, F, S, S, ?

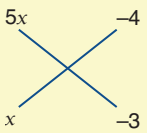
2 A man passing a beggar in the street exclaimed, 'I am that beggar's father!' But the beggar was not the man's son. How can this be?

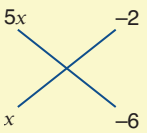
3 Two guards are guarding two sacks. One guard always tells the truth, but the other guard always lies, but you do not know which guard is which. One of the sacks is full of gold; the other is full of peanuts. You are permitted to take one of the sacks but you are not sure which one contains the gold. You are also allowed to ask one of the guards just one question.

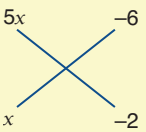
What question should you ask to ensure you get the sack of gold?

c Which diagram will give the factors of $5x^2 - 19x + 12$?

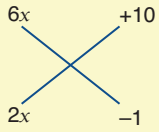
i 

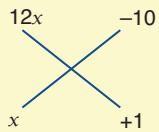
ii 

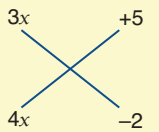
iii 

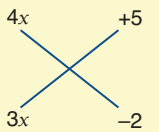
iv 

d Which diagram will give the factors of $12x^2 + 7x - 10$?

i 

ii 

iii 

iv 

2 Factorise these expressions.

a $2x^2 + 7x + 3$	**b** $3x^2 + 8x + 4$	**c** $2x^2 + 7x + 6$
d $2x^2 + 11x + 5$	**e** $3x^2 + 5x + 2$	**f** $2x^2 + 11x + 15$
g $4x^2 + 13x + 3$	**h** $5x^2 + 17x + 6$	**i** $2x^2 + 13x + 15$
j $2x^2 - 5x + 2$	**k** $3x^2 - 11x + 6$	**l** $5x^2 - 17x + 6$
m $4x^2 - 11x + 6$	**n** $10x^2 - 21x + 9$	**o** $5x^2 - 22x + 21$
p $2x^2 + x - 10$	**q** $3x^2 + 4x - 15$	**r** $4x^2 + 11x - 3$
s $2x^2 - x - 6$	**t** $2x^2 - 5x - 3$	**u** $3x^2 - x - 30$
v $6x^2 - 5x - 21$	**w** $2x^2 - 5x - 12$	**x** $4x^2 - x - 18$

3 Find the factors of the following:

a $12x^2 + 7x + 1$	**b** $6a^2 + 5a + 1$	**c** $6p^2 + 7p + 2$
d $10y^2 - 9y + 2$	**e** $12x^2 - 7x + 1$	**f** $9a^2 - 21a + 10$
g $8m^2 + 18m - 5$	**h** $6n^2 - 7n - 3$	**i** $21q^2 - 20q + 4$
j $20x^2 - x - 1$	**k** $8m^2 - 2m - 15$	**l** $18y^2 - 3y - 10$
m $6a^2 + 5a - 6$	**n** $15k^2 + 26k + 8$	**o** $8x^2 + 18x + 9$
p $4 - 3a - a^2$	**q** $2 + m - 10m^2$	**r** $6 + 7x - 3x^2$
s $6 - 7x - 3x^2$	**t** $15 - x - 28x^2$	**u** $2 + 9n - 35n^2$
v $3x^2 + 10xy + 8y^2$	**w** $2x^2 - 5xy + 2y^2$	**x** $5m^2 - 2mn - 7n^2$

4 Factorise by first taking out the common factor.

a $6x^2 + 10x - 4$	**b** $6a^2 - 2a - 4$	**c** $6a^2 + 9a - 27$
d $8x^2 + 12x - 36$	**e** $6x^2 + 28x + 16$	**f** $12p^2 + 12p - 9$
g $30q^2 + 55q - 35$	**h** $10m^2 - 46m + 24$	**i** $50a^2 + 15a - 5$
j $4 - 6x - 10x^2$	**k** $36 - 3t - 3t^2$	**l** $9 + 24x + 12x^2$

5 Complete each in as many ways as possible by writing positive whole numbers in the boxes and inserting operation signs.

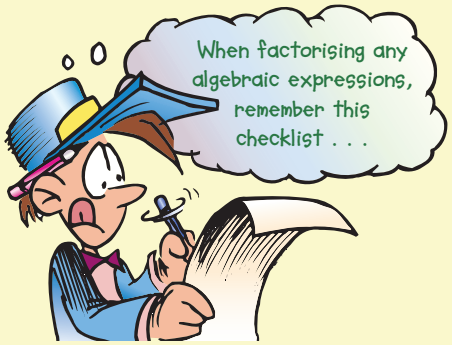
a $(x \ldots \square)(x \ldots \square) = x^2 \ldots \square x \ldots 15$

b $(x \ldots \square)(x \ldots \square) = x^2 \ldots \square x - 12$

c $(x \ldots \square)(x \ldots \square) = x^2 \ldots 5x + \square$

d $(5x \ldots \square)(x \ldots \square) = 5x^2 \ldots \square x \ldots 2$

7:06 | Factorising: Miscellaneous Types



First:
Always take out any common factor.
Then:
If there are two terms, is it a difference of two squares, $a^2 - b^2$?
If there are three terms, is it a quadratic trinomial, $ax^2 + bx + c$?
If there are four terms, can it be factorised by grouping the terms into pairs?

worked examples

1 $4x^2 - 36$
$= 4(x^2 - 9)$ common factor
$= 4(x - 3)(x + 3)$ diff. of 2 squares

2 $15x^2y - 20xy + 10xy^2$
$= 5xy(3x - 4 + 2y)$ common factor

3 $8x^2 - 40x + 32$
$= 8(x^2 - 5x + 4)$ common factor
$= 8(x - 4)(x - 1)$ quadratic trinomial

4 $12 - a - 6a^2$
$= (3 + 2a)(4 - 3a)$ quadratic trinomial

3 6 $-6a$ a $-3a$ $2a$
4 2 a $-6a$ $2a$ $-3a$

5 $ap - aq - 3p + 3q$
$= a(p - q) - 3(p - q)$ grouping terms into pairs
$= (p - q)(a - 3)$

Exercise 7:06

1 Factorise each of these expressions:

a $x^2 - 6x + 5$	**b** $x^2 - 9$	**c** $xy + 2y + 9x + 18$	**d** $a^2 - 9a$
e $a^2 - 6a + 9$	**f** $4x^2 - 1$	**g** $12x^2 - x - 35$	**h** $a^2 - 13a + 40$
i $5a^2b - 10ab^3$	**j** $p^2 - q^2$	**k** $pq - 3p + 10q - 30$	**l** $7x^2 + 11x - 6$
m $a^2 + 3a - ab$	**n** $16 - 25a^2$	**o** $1 - 2a - 24a^2$	**p** $4m + 4n - am - an$
q $5ay - 10y + 15xy$	**r** $15x^2 - x - 28$	**s** $x^2y^2 - 1$	**t** $x^2 - x - 56$
u $2mn + 3np + 4m + 6p$		**v** $100a^2 - 49x^2$	
w $2 - 5x - 3x^2$		**x** $k^2 + 2k - 48$	

2 Factorise completely:

a $2 - 8x^2$	**b** $5x^2 - 10x - 5xy + 10y$	**c** $2a^2 - 22a + 48$
d $3m^2 - 18m + 27$	**e** $x^4 - 1$	**f** $p^3 - 4p^2 - p + 4$
g $4x^2 - 36$	**h** $a^3 - a$	**i** $3a^2 - 39a + 120$
j $9 - 9p^2$	**k** $3k^2 + 3k - 18$	**l** $24a^2 - 42a + 9$
m $ax^2 + axy + 3ax + 3ay$	**n** $(x + y)^2 + 3(x + y)$	**o** $5xy^2 - 20xz^2$
p $6ax^2 + 5ax - 6a$	**q** $x^2 - y^2 + 5x - 5y$	**r** $3x^2 - 12x + 12$
s $63x^2 - 28y^2$	**t** $a^4 - 16$	**u** $(a - 2)^2 - 4$
v $1 + p + p^2 + p^3$	**w** $8t^2 - 28t - 60$	**x** $8 - 8x - 6x^2$

2 **a** $(a+b)(p+q)$ **b** $(3+x)(a+b)$ **c** $(m+3p)(n+5)$ **d** $(a+c)(a+b)$ **e** $(3x+y)(3x-4)$
f $(3p-4)(4p+q)$ **g** $(b+3)(a+c)$ **h** $(x+1)(y+4)$ **i** $(a^2+1)(a+1)$ **j** $(p+r)(q+5)$
k $(y-1)(x+1)$ **l** $(2+y)(4a-1)$ **m** $(m+1)(n+1)$ **n** $(x+m)(x+y)$ **o** $(x+w)(x-y)$
p $(x+z)(x+y)$ **q** $(a+4)(11+c)$ **r** $(a-1)(a^2+1)$
3 **a** $(y+z)(x-w)$ **b** $(a+c)(b-d)$ **c** $(a+3)(5-b)$ **d** $(x-4)(6-y)$ **e** $(y+2)(11-x)$
f $(ax-1)(x-1)$

Prep Quiz 7:03

1 4 **2** 7 **3** 11 **4** x **5** $3x$ **6** $8x$ **7** x^2-4 **8** x^2-25 **9** $49-a^2$ **10** $9m^2-4n^2$

Exercise 7:03

1 **a** $(x-2)(x+2)$ **b** $(a+4)(a-4)$ **c** $(m+5)(m-5)$ **d** $(p-9)(p+9)$
e $(y-10)(y+10)$ **f** $(x-11)(x+11)$ **g** $(3-x)(3+x)$ **h** $(1-n)(1+n)$
i $(7-y)(7+y)$ **j** $(a-b)(a+b)$ **k** $(x-a)(x+a)$ **l** $(y+a)(y-a)$
m $(3a-2)(3a+2)$ **n** $(4x-1)(4x+1)$ **o** $(5p-3)(5p+3)$ **p** $(7-2a)(7+2a)$
q $(5p-a)(5p+a)$ **r** $(m-9n)(m+9n)$ **s** $(10a-3b)(10a+3b)$ **t** $(9x+11y)(9x-11y)$
2 **a** $2(x-4)(x+4)$ **b** $3(x-6)(x+6)$ **c** $4(a-5)(a+5)$ **d** $5(y-2)(y+2)$
e $6(2a-b)(2a+b)$ **f** $3(x-3y)(x+3y)$ **g** $8(y-4)(y+4)$ **h** $5(4p-q)(4p+q)$
i $4(x-4)(x+4)$ **j** $3(x-1)(x+1)$ **k** $2(6p-1)(6p+1)$ **l** $2(1-3x)(1+3x)$
m $2(2a-3m)(2a+3m)$ **n** $5(5-2a)(5+2a)$ **o** $2(10x-3y)(10x+3y)$ **p** $2(7m-2n)(7m+2n)$

Challenge 7:03 The difference of two cubes (Extension)

Volume of part ①	*Volume of part* ②	*Volume of part* ③	*Volume of part* ④
$b \times b \times b$	$(a-b) \times b \times b$	$(a-b) \times a \times b$	$a \times a \times (a-b)$

$\therefore\ a^3 = b^3 + (ab^2 - b^3) + (a^2b - ab^2) + (a^3 - a^2b)$
$a^3 - b^3 = (a-b)b^2 + (a-b)ab + (a-b)a^2$
$= (a-b)(a^2 + ab + b^2)$

1 $(m-n)(m^2+mn+n^2)$ **2** $(x-y)(x^2+xy+y^2)$ **3** $(a-2)(a^2+2a+4)$
4 $(m-3)(m^2+3m+9)$ **5** $(x-10)(x^2+10x+100)$ **6** $(y-5)(y^2+5y+25)$
7 $(4-n)(16+4n+n^2)$ **8** $(3-k)(9+3k+k^2)$ **9** $(2m-3)(4m^2+6m+9)$
10 $(4x-5y)(16x^2+20xy+25y^2)$ **11** $(5x-2y)(25x^2+10xy+4y^2)$ **12** $(3m-7n)(9m^2+21mn+49n^2)$

Prep Quiz 7:04

1 x^2+5x+6 **2** a^2+2a-3 **3** $m^2-9m+14$ **4** $x^2+10x+25$ **5** a^2-4a+4 **6** 3, 2
7 4, 5 **8** –5, 3 **9** 4, –1 **10** 9, –2

Exercise 7:04

1 **a** $(x+3)(x+1)$ **b** $(x+2)(x+1)$ **c** $(x+5)(x+1)$ **d** $(x+6)(x+1)$ **e** $(x+5)(x+4)$
f $(x+5)(x+5)$ **g** $(x+6)(x+6)$ **h** $(x+7)(x+3)$ **i** $(x+6)(x+3)$ **j** $(x+10)(x+4)$
k $(x+6)(x+9)$ **l** $(x+9)(x+4)$ **m** $(x-2)(x-2)$ **n** $(x-6)(x-6)$ **o** $(x-4)(x-3)$
p $(x-5)(x-4)$ **q** $(x+3)(x-1)$ **r** $(x+4)(x-3)$ **s** $(x+6)(x-2)$ **t** $(x+10)(x-3)$
u $(x-2)(x+1)$ **v** $(x-12)(x+2)$ **w** $(x-10)(x+3)$ **x** $(x-8)(x+7)$
2 **a** $(a+4)(a+2)$ **b** $(m+6)(m+3)$ **c** $(y+6)(y+7)$ **d** $(p+3)(p+4)$ **e** $(x+2)(x+10)$
f $(n+14)(n+3)$ **g** $(s+18)(x+3)$ **h** $(a+4)(a+14)$ **i** $(x-4)(x+1)$ **j** $(a-4)(a+2)$
k $(p-8)(p+3)$ **l** $(y+3)(y-2)$ **m** $(x+8)(x-1)$ **n** $(q+8)(q-3)$ **o** $(m+15)(m-3)$
p $(a+21)(a-3)$ **q** $(y+11)(y-5)$ **r** $(x-1)(x-1)$ **s** $(k-3)(k-2)$ **t** $(x-9)(x-4)$
u $(a-18)(a-4)$ **v** $(p+6)(p+16)$ **w** $(q-15)(q+3)$ **x** $(m-11)(m+7)$
3 **a** $2(x+2)(x+1)$ **b** $3(x-3)(x+1)$ **c** $5(x-4)(x+2)$ **d** $2(x+4)(x+4)$ **e** $3(x-11)(x+1)$
f $3(x+3)(x+4)$ **g** $4(a-5)(a+2)$ **h** $2(n+3)(n+1)$ **i** $5(x-4)(x-2)$ **j** $3(x-3)(x-4)$
k $3(a-9)(a+4)$ **l** $5(x+10)(x-7)$

Exercise 7:05

1 **a** iii **b** iv **c** ii **d** iv
2 **a** $(2x+1)(x+3)$ **b** $(3x+2)(x+2)$ **c** $(2x+3)(x+2)$ **d** $(2x+1)(x+5)$ **e** $(3x+2)(x+1)$
f $(2x+5)(x+3)$ **g** $(x+3)(4x+1)$ **h** $(5x+2)(x+3)$ **i** $(2x+3)(x+5)$ **j** $(2x-1)(x-2)$
k $(3x-2)(x-3)$ **l** $(5x-2)(x-3)$ **m** $(x-2)(4x-3)$ **n** $(5x-3)(2x-3)$ **o** $(5x-7)(x-3)$
p $(2x+5)(x-2)$ **q** $(3x-5)(x+3)$ **r** $(x+3)(4x-1)$ **s** $(2x+3)(x-2)$ **t** $(2x+1)(x-3)$
u $(3x-10)(x+3)$ **v** $(2x+3)(3x-7)$ **w** $(2x+3)(x-4)$ **x** $(x+2)(4x-9)$

3 **a** $(3x+1)(4x+1)$ **b** $(3a+1)(2a+1)$ **c** $(3p+2)(2p+1)$ **d** $(5y-2)(2y-1)$ **e** $(3x-1)(4x-1)$
f $(3a-2)(3a-5)$ **g** $(2m+5)(4m-1)$ **h** $(2n-3)(3n+1)$ **i** $(7q-2)(3q-2)$ **j** $(4x-1)(5x+1)$
k $(2m-3)(4m+5)$ **l** $(6y-5)(3y+2)$ **m** $(2a+3)(3a-2)$ **n** $(3k+4)(5k+2)$ **o** $(2x+3)(4x+3)$
p $(4+a)(1-a)$ **q** $(2+5m)(1-2m)$ **r** $(3x+2)(3-x)$ **s** $(2-3x)(x+3)$ **t** $(5-7x)(4x+3)$
u $(2-5n)(1+7n)$ **v** $(3x+4y)(x+2y)$ **w** $(2x-y)(x-2y)$ **x** $(5m-7n)(m+n)$

4 **a** $2(3x-1)(x+2)$ **b** $2(3a+2)(a-1)$ **c** $3(2a-3)(a+3)$ **d** $4(2x-3)(x+3)$ **e** $2(3x+2)(x+4)$
f $3(2p-1)(2p+3)$ **g** $5(3q+7)(2q-1)$ **h** $2(5m-3)(m-4)$ **i** $5(5a-1)(2a+1)$ **j** $2(2-5x)(1+x)$
k $3(3-t)(t+4)$ **l** $3(3+2x)(1+2x)$

5 **a** $(x+3)(x+5)=x^2+8x+15$; $(x-3)(x+5)=x^2+2x-15$; $(x+3)(x-5)=x^2-2x-15$;
$(x-3)(x-5)=x^2-8x+15$; $(x+1)(x+15)=x^2+16x+15$; $(x-1)(x+15)=x^2+14x-15$;
$(x+1)(x-15)=x^2-14x-15$; $(x-1)(x-15)=x^2-16x+15$

b $(x-1)(x+12)=x^2+11x-12$; $(x-12)(x+1)=x^2-11x-12$; $(x-3)(x+4)=x^2+x-12$;
$(x-4)(x+3)=x^2-x-12$; $(x-6)(x+2)=x^2-4x-12$; $(x-2)(x+6)=x^2+4x-12$

c $(x-1)(x-4)=x^2-5x+4$; $(x+1)(x+4)=x^2+5x+4$; $(x-2)(x-3)=x^2-5x+6$; $(x+2)(x+3)=x^2+5x+6$

d $(5x+1)(x+2)=5x^2+11x+2$; $(5x+1)(x-2)=5x^2-9x-2$; $(5x-1)(x+2)=5x^2+9x-2$;
$(5x-1)(x-2)=5x^2-11x+2$

Challenge 7:05 Another factorising method for harder trinomials

1 $(2x+3)(x+2)$ **2** $(4x+1)(x-5)$ **3** $(3x-4)(x-3)$ **4** $(2x+1)(3x+2)$ **5** $(5x-1)(x+2)$ **6** $(4x-3)(3x-4)$

Exercise 7:06

1 **a** $(x-5)(x-1)$ **b** $(x-3)(x+3)$ **c** $(x+2)(y+9)$ **d** $a(a-9)$
e $(a-3)(a-3)$ **f** $(2x-1)(2x+1)$ **g** $(4x-7)(3x+5)$ **h** $(a-5)(a-8)$
i $5ab(a-2b^2)$ **j** $(p-q)(p+q)$ **k** $(p+10)(q-3)$ **l** $(7x-3)(x+2)$
m $a(a+3-b)$ **n** $(4-5a)(4+5a)$ **o** $(1+4a)(1-6a)$ **p** $(m+n)(4-a)$
q $5y(a-2+3x)$ **r** $(5x-7)(3x+4)$ **s** $(xy-1)(xy+1)$ **t** $(x-8)(x+7)$
u $(2m+3p)(n+2)$ **v** $(10a-7x)(10a+7x)$ **w** $(2+x)(1-3x)$ **x** $(k+8)(k-6)$

2 **a** $2(1-2x)(1+2x)$ **b** $5(x-y)(x-2)$ **c** $2(a-8)(a-3)$ **d** $3(m-3)(m-3)$
e $(x-1)(x+1)(x^2+1)$ **f** $(p-4)(p-1)(p+1)$ **g** $4(x-3)(x+3)$ **h** $a(a-1)(a+1)$
i $3(a-8)(a-5)$ **j** $9(1-p)(1+p)$ **k** $3(k+3)(k-2)$ **l** $3(2a-3)(4a-1)$
m $a(x+y)(x+3)$ **n** $(x+y)(x+y+3)$ **o** $5x(y-2z)(y+2z)$ **p** $a(3x-2)(2x+3)$
q $(x-y)(x+y+5)$ **r** $3(x-2)(x-2)$ **s** $7(3x-2y)(3x+2y)$ **t** $(a^2+4)(a-2)(a+2)$
u $a(a-4)$ **v** $(1+p)(1+p^2)$ **w** $4(2t+3)(t-5)$ **x** $2(2+x)(2-3x)$

Prep Quiz 7:07

1 $\frac{a}{2}$ **2** $\frac{3y}{2x}$ **3** 4 **4** $\frac{3}{2}$ **5** $3x(2x+3)$ **6** $(x+3)(x+4)$ **7** $(x-7)(x+7)$ **8** $3(x+1)^2$ **9** $(x+y)(3+a)$
10 $(2x-1)(x+5)$

Exercise 7:07

1 **a** $x+2$ **b** $\frac{2}{x+3}$ **c** $\frac{4}{x-3}$ **d** 2 **e** $\frac{1}{3}$ **f** $\frac{5}{8}$ **g** $\frac{1}{2}$ **h** $\frac{7}{3}$
i $\frac{x+1}{x-1}$ **j** $x+2$ **k** $\frac{1}{a-1}$ **l** $\frac{2y-3}{2}$ **m** $\frac{a-4}{3-a}$ **n** $x+1$ **o** $\frac{x+6}{3}$ **p** $a-4$
q $x-3$ **r** $\frac{x-2}{x+1}$ **s** $\frac{x+1}{x+3}$ **t** $\frac{m+8}{m-4}$ **u** $\frac{t+4}{t-3}$ **v** $\frac{a-x}{a+3}$ **w** $\frac{x-1}{2x-1}$ **x** $\frac{2(3a-2)}{2a-1}$

2 **a** $4x$ **b** $\frac{y-3}{4}$ **c** $\frac{10}{21}$ **d** $\frac{15}{2}$ **e** $\frac{1}{3}$ **f** $\frac{3(1+2a)}{5(1-2a)}$ **g** $\frac{y(2y+3)}{3(y+4)}$ **h** $\frac{2x+5}{9}$
i $\frac{1}{x+1}$ **j** $\frac{x+7}{x-5}$ **k** $\frac{a+3}{a-1}$ **l** 1 **m** $\frac{x+3}{x+7}$ **n** $\frac{m+1}{m+5}$ **o** $\frac{(a+2)(a-4)}{(a+4)(a-1)}$
p $\frac{x+4}{2}$ **q** 1 **r** $\frac{a}{2a-1}$ **s** 2 **t** $\frac{(a+b-c)(a-c)}{a+c}$

3 **a** 6 **b** $\frac{2}{7}$ **c** 5 **d** $\frac{9}{2}$ **e** $\frac{3}{5(x+1)}$ **f** 16 **g** $\frac{m}{2}$ **h** $\frac{5k}{k-1}$
i $\frac{n-3}{n+2}$ **j** $\frac{y}{y-7}$ **k** $\frac{a+1}{a-3}$ **l** 1 **m** $\frac{x+2}{x-3}$ **n** $\frac{p+4}{p-4}$ **o** $\frac{(n-7)(n-3)}{(n+1)(n+7)}$
p 2 **q** $3(x-1)$ **r** 1 **s** 2 **t** $\frac{(p+q+r)(p-q)}{p+q}$