S2 Block Test 1
Revision Booklet B
MP1/2

Algebra- Factorise

Q1. Factorise by finding the common factor

a.	$2x+4$	**b.**	$3d+9$	**c.**	$6s+3$	**d.**	$12x+4$
e.	$6+9a$	**f.**	$2b+8$	**g.**	$5y+10$	**h.**	$10+15c$
i.	$12x+16$	**j.**	$18m+24$	**k.**	$30+36a$	**l.**	$14y+21$

Q2. Factorise by finding the common factor

a.	$3x-6$	**b.**	$4y-8$	**c.**	$16-8a$	**d.**	$10c-15$
e.	$9s-12$	**f.**	$2b-14$	**g.**	$12x-20$	**h.**	$22m-33$
i.	$15x-10$	**j.**	$18-12y$	**k.**	$25b-20$	**l.**	$18d-30$

Q3. Factorise by finding the common factor

a.	$2a+4b$	**b.**	$10x-12y$	**c.**	$18m+24n$	**d.**	$10c+15d$
e.	$6a-9x$	**f.**	$18s-12t$	**g.**	$12x+15y$	**h.**	$14a-7b$
i.	$25c+10d$	**j.**	$9b-15y$	**k.**	$18x+24y$	**l.**	$6a+28b$

Q4. Factorise by finding the common factor

a.	$ax+ay$	**b.**	xy^2+xa^2	**c.**	$pqr+pst$
d.	$xay-bac$	**e.**	$pq+p$	**f.**	y^2+y
g.	a^2-ab	**h.**	$ab-bc$	**i.**	n^2-3n
j.	$xy+y^2$	**k.**	$abc-abd$	**l.**	$fgh-efg$

Q5. Factorise by finding the highest common factor

a.	$2ax+6a$	**b.**	$3y+9y^2$	**c.**	$24a-16ab$
d.	pq^2-pq	**e.**	$12xy-9xz$	**f.**	$6b^2-4b$
g.	$3a^2+27ah$	**h.**	$15abc+20abd$	**i.**	$3s^3-9s^2$
j.	$14x-12xyz$	**k.**	$10b^2c-15bcd$	**l.**	$2\pi r^2+2\pi rh$

Q6. Factorise

a.	$ap+aq-ar$	**b.**	$2a+2b+2c$	**c.**	$6e-2f+4g$
d.	$p^2+pq+xp$	**e.**	$3ab-6bc-9bd$	**f.**	$\frac{1}{2}ah+\frac{1}{2}bh+\frac{1}{2}ch$
g.	$5x^2-8xy+5x$	**h.**	$4ac+6ad-10a^2$	**i.**	$15p^2+10pq+20ps$

Q7. Factorise

a.	ab^2c-a^2bd	**b.**	a^3-a^2-a	**c.**	$2x^2-50x+12xy$
d.	$x^6+x^4+x^2$	**e.**	$25p^2+15pq+10p$	**f.**	$x^2yz+axy+bxy^2$
g.	$3a^4+9a^3-6a$	**h.**	$abx+bcx-bcy$	**i.**	$\frac{1}{2}gtT-\frac{1}{2}gt^2$

Algebra- Factorise

Q1.	**a.**	$2(x+2)$	**b.**	$3(d+3)$	**c.**	$3(2s+1)$	**d.**	$4(3x+1)$
	e.	$3(2+3a)$	**f.**	$2(b+4)$	**g.**	$5(y+2)$	**h.**	$5(2+3c)$
	i.	$4(3x+4)$	**j.**	$6(3m+4)$	**k.**	$6(5+6a)$	**l.**	$7(2y+3)$
Q2.	**a.**	$3(x-2)$	**b.**	$4(y-2)$	**c.**	$8(2-a)$	**d.**	$5(2c-3)$
	e.	$3(3s-4)$	**f.**	$2(b-7)$	**g.**	$4(3x-5)$	**h.**	$11(2m-3)$
	i.	$5(3x-2)$	**j.**	$6(3-2y)$	**k.**	$5(5b-4)$	**l.**	$6(3d-5)$
Q3.	**a.**	$2(a+2b)$	**b.**	$2(5x+6y)$	**c.**	$6(3m+4n)$	**d.**	$5(2c+3d)$
	e.	$3(2a-3x)$	**f.**	$6(3s-2t)$	**g.**	$3(4x+5y)$	**h.**	$7(2a-b)$
	i.	$5(5c+2d)$	**j.**	$3(3b-5y)$	**k.**	$6(3x+4y)$	**l.**	$2(3a+14b)$
Q4.	**a.**	$a(x+y)$	**b.**	$x(y^2+a^2)$	**c.**	$p(qr+st)$	**d.**	$a(xy-bc)$
	e.	$p(q+1)$	**f.**	$y(y+1)$	**g.**	$a(a-b)$	**h.**	$b(a-c)$
	i.	$n(n-3)$	**j.**	$y(x+y)$	**k.**	$ab(c-d)$	**l.**	$fg(h-e)$
Q5.	**a.**	$2a(a+3)$	**b.**	$3y(1+3y)$	**c.**	$8a(3-2b)$	**d.**	$pq(q-1)$
	e.	$3x(4y-3z)$	**f.**	$2b(3b-2)$	**g.**	$3a(a+9h)$	**h.**	$5ab(3c+4d)$
	i.	$3s^2(s-3)$	**j.**	$2x(7-6yz)$	**k.**	$5bc(2b-3d)$	**l.**	$2\pi r(r+h)$

Q6.	**a.**	$a(p+q+r)$	**b.**	$2(a+b+c)$	**c.**	$2(3e-f+2g)$
	d.	$p(p+q+x)$	**e.**	$3b(a-2c-3d)$	**f.**	$\frac{1}{2}h(a+b+c)$
	g.	$x(5x-8y+5)$	**h.**	$2a(2c+3d-5a)$	**i.**	$5p(3p+2q+4s)$
Q7.	**a.**	$ab(bc-ad)$	**b.**	$a(a^2-a-1)$	**c.**	$2x(x-25+6y)$
	d.	$x^2(x^4+x^2+1)$	**e.**	$5p(5p+3q+2)$	**f.**	$xy(xz+a+by)$
	g.	$3a(a^3+3a^2-2)$	**h.**	$b(ax+cx-cy)$	**i.**	$\frac{1}{2}gt(T-t)$

Percentages

Exercise 1 Percentages - no calculator

1. Find each of the following **without** a calculator :-

a	10% of £24	b	30% of £420	c	20% of $55	d	$33\frac{1}{3}$% of 690 kg
e	25% of £32	f	75% of 50 m	g	$66\frac{2}{3}$% of 39 km	h	5% of $600
i	3% of £7	j	22% of 7000	k	2·5% of 160 cm	l	35% of €700

2. a A shop is giving a 20% discount on a £240 exercise bike.

   How much is the bike now ?

   b Julian cycles 30 km **per day** every day. He is going to reduce this by 15%.

   How many km will he cycle next **week** ?

3. A bank pays an annual rate of 5% interest on their High Fliers account. Gaz leaves £4800 in his account for a year.

   How much interest will he have after :-

   a one year b six months c three months ?

4. Five hundred students were asked their favourite take away.

   40% - Pizza 35% - Chinese 20% - Indian the rest - Chip shop

   How many students chose :- a Chinese b Chip shop ?

Exercise 2 Percentages with a calculator

1. Find using a calculator :- (Show all your working)

a	23% of 136 km	b	76% of 78 kg	c	19% of 320 m
d	38·5% of £700	e	0·6% of $1260	f	12·5% of €40
g	9% of £340	h	111% of 750 km	i	3·7% of £10.

Percentages

2. a A farmer has 3200 chickens. 32% have caught a virus.

   (i) What percentage of chickens do NOT have a virus ?

   (ii) How many chickens do NOT have a virus ?

   b Ninety percent of the chickens produce an egg every **day**.

   How many eggs are produced every **week** ?

   c 2·5% of the weekly produce has to be destroyed.

   How many eggs are destroyed ?

3. 

Last November, Norma weighed 64 kg.
After Xmas, her weight had increased by 9%.

What was her weight after Xmas ?

4. Twins Joe and Jack are sales directors who earn £28 000 each.

   - Joe is given a wage rise of 7·5%.
   - Jack has his wage reduced by 4%.

   How much **more** does Joe now earn than Jack ?

Exercise 3 — Linking fractions, decimals & percentages

1. Change each of these fractions to percentages, correct to 1 decimal place :-

   a $\frac{2}{3}$ b $\frac{1}{7}$ c $\frac{71}{90}$ d $\frac{142}{80}$.

2. Heather scored the following in four tests :-

   Maths - $\frac{17}{20}$ *English* - $\frac{26}{32}$

   French - $\frac{33}{45}$ *Music* - $\frac{7}{10}$

   a Change each test mark into a percentage.

   b Which was her best score ?

3. Re-write the following in order, smallest first :-

   a 0·5, 47%, $\frac{24}{50}$, 0·49 b 45% of £72, $\frac{2}{3}$ of £48, 0·04 x £804.

Percentages

Revisit - Review - Revise Exercise 6a

1. Change each of the following into a fraction in its simplest form :-

   a 50% b 25% c 75% d 33·333....%

   e 60% f 70% g 5% h 77%.

2. Change each of the following to a percentage :-

   a 0·43 b 0·09 c 0·3 d 0·225

   e $\frac{2}{3}$ f $\frac{4}{5}$ g 1·25 h $1\frac{1}{2}$.

3. a David gets a 10% **increase** on his £1640 monthly wage.
   How much does he now earn ?

   b Angela has her £640 weekly wage **decreased** by 15%.
   How much is her weekly wage now ?

Revisit - Review - Revise Exercise 6b

1. Find using a calculator :- (Show all your working)

   a 27% of 2300 km b 57% of 18 kg c 13% of 608 m

   d 27·5% of £1100 e 0·3% of $4500 f 105% of €400

   g 0·75 x £340 h 0·1 x 550 kg i 0·005 x 8600

   j $\frac{2}{3}$ of $810 k $\frac{4}{5}$ of 8855 m l $\frac{12}{13}$ of 520 km.

2. Keith earns £18 400 per annum as a plumber.
   How much would he earn if his salary was :-

   a increased by 17% b decreased by 9·5% ?

3. 

   SpotsAlive buy football strips for £25.
   They intend to sell them at a profit of 28%.
   How much should they sell each strip for ?

4. A car costs £8600 cash.
   VirgoCars let you pay a 16% deposit and
   36 monthly payments of £224·35.
   How much cheaper is it to pay cash ?

Answers

Exercise 1 - Percentages - No Calculator

1. a £2·40 b £126 c $11 c 230 kg
   d £8 e 37·5 m g 26 km h $30
   i 21p j 1540 k 4 cm l €245
2. a £192 b 178·5 km
3. a £240 b £120 c £60
4. a 175 b 25

Exercise 2 - Percentages with a Calculator

1. a 31·28 km b 59·28 kg c 60·8 m
   d £269·50 e $7·56 f €5
   g £30·60 h 832·5 km i 37p
2. a (i) 68% (ii) 2176 b 20160 c 504
3. 69·76 kg
4. £3220

Exercise 3 - Linking Fractions, Decimals % %ages

1. a 66·7% b 14·3% c 78·9% d 177·5%
2. a Maths - 85%, English - 81·25%,
   French - 73·3%, Music - 70%
   b Maths (obviously)
3. a 47% - $^{24}/_{50}$ - 0·49 - 0·5
   b $^{2}/_{3}$ of £48 - 0·04 x £804 - 45% of £72

Review - Revisit - Revise Exercise 6a

1. a $^{1}/_{2}$ b $^{1}/_{4}$ c $^{3}/_{4}$ d $^{1}/_{3}$
   e $^{3}/_{5}$ f $^{7}/_{10}$ g $^{1}/_{20}$ h $^{77}/_{100}$
2. a 43% b 9% c 30% d 22·5%
   e 66·66..% f 80% g 125% h 150%
3. a £1804 b £544

Review - Revisit - Revise Exercise 6b

1. a £621 b 10·26 kg c 79·04 m
   d £302·50 e $13·50 f €420
   g £255 h 55 kg i 43
   j $540 k 7084 m l 480 km
2. a £21528 b £16652
3. £32
4. £852·60

Algebra

Exercise 2

1. Multiply out the brackets :-

a	$2(a+5)$	b	$3(x+2)$	c	$6(g+1)$	d	$7(m+4)$
e	$2(x-3)$	f	$5(n-2)$	g	$8(p-1)$	h	$10(t-4)$
i	$5(m-4)$	j	$2(1-u)$	k	$7(2-x)$	l	$15(2+k)$
m	$4(a+b)$	n	$2(c+d)$	o	$5(m-n)$	p	$10(d-e)$
q	$20(3+x)$	r	$30(4-w)$	s	$100(a-3)$	t	$50(g-6)$.

2. Remove the brackets :-

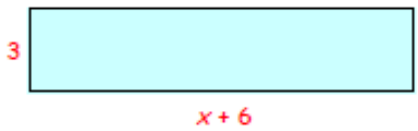
a	$2(3x+1)$	b	$2(4a+3)$	c	$3(1+5d)$	d	$4(3-5k)$
e	$7(7h-2)$	f	$8(5-4n)$	g	$6(5a+y)$	h	$2(6t+2z)$
i	$2(5b-4c)$	j	$7(10k-2p)$	k	$x(y+2)$	l	$a(b-8)$
m	$v(w-1)$	n	$a(a-3)$	o	$p(1-p)$	p	$x(2+x)$
q	$p(3q+r)$	r	$5a(2-4a)$	s	$2u(10u-y)$	t	$2(3a+2b+1)$
u	$5(2v+6w+8y)$	v	$3(5x-2y-4z)$	w	$10(p+q-4r)$	x	$8(3u-5v-9)$.

3. Rewrite the following without brackets :-

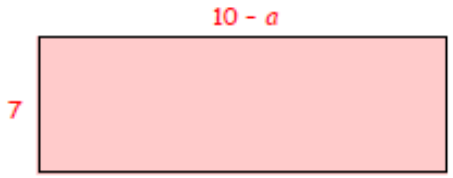
a	$-3(x+1)$	b	$-2(a-5)$	c	$-(m+n)$	d	$-(m-n)$
e	$-6(p-q)$	f	$-x(x+7)$	g	$-p(1+p)$	h	$-2w(w+9)$
i	$-k(7k-1)$	j	$-4e(2e+10)$	k	$-x(3y-8x)$	l	$-p^2(p-10q)$.

4. Write the areas of these two rectangles :- (*All units are in centimetres*). (i) with brackets (ii) without brackets.

a



b



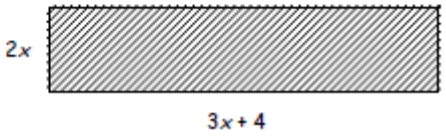
Algebra

Exercise 2 Breaking Brackets

1. Multiply out each bracket :-

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

2. Write down the **area** and **perimeter** of this rectangle :-
   a using brackets
   b without brackets.

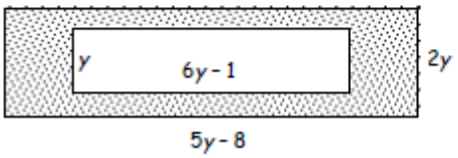


Exercise 3 Breaking Brackets and Simplifying

1. Multiply out the brackets and simplify fully where necessary :-

a	$5(k+2)+3$	b	$8(2y+4)-12$	c	$7(3e-2)+11$
d	$8+2(t+3)$	e	$11-3(3+w)$	f	$15-(g+15)$
g	$3(w-1)+2(w+1)$	h	$4(2y-3)+5(4y+3)$	i	$2(4r+3)-6$
j	$3w-(w+4)+2(2-w)$	k	$4(3y+4)-2(5y-1)-18$		
l	$3p+2(4p-6)-(9p+12)$	m	$5(3-2m)+3(2m-6)-4(1-8m)+2m+7$.		

2. Calculate the shaded area of the rectangle shown, in terms of y.



Solutions

Exercise 2 - Breaking Brackets

1. a $3x + 12$ b $7y - 21$
   c $10k + 25$ d $66y - 77$
   e $y^2 + 2y$ f $k^2 - 3k$
   g $3u^2 + 12u$ h $9r^2 - 12r$
   i $-3q - 15$ j $-8t - 24$
   k $-5j + 10$ l $-6f + 16$
   m $-y^2 - 7y$ n $-h^2 + 3h$
   o $-4w^2 - 2w$ p $-15k + 20k^2$

2. a $A = 2x(3x + 4)$ b $A = 6x^2 + 8x$

Exercise 3 - Breaking Brackets & Simplifying

1. a $5k + 13$ b $16y + 20$ c $21e - 3$
   d $2t + 14$ e $2 - 3w$ f $-g$
   g $5w - 1$ h $28y + 3$ i $8r$
   j 0 k $2y$
   l $2p - 24$ m $30m$
2. $A = 2y(5y - 8) - y(6y - 1) = 10y^2 - 16y - 6y^2 + y$
   $A = 4y^2 - 15y$