Equations with brackets

Starter

1. **(Review of last lesson)**

Solve: (a) $9 - 4x = 33$ (b) $7 - 2x = 2x - 7$

Working: (a)

	$9 - 4x = 33$
Add $4x$ ***to both sides:***	$9 = 33 + 4x$
Subtract 33 ***from both sides:***	$-24 = 4x$
Divide by 4***:***	$-6 = x$
Make sure the unknown is on the LHS:	$x = -6$

(b)

	$7 - 2x = 2x - 7$
Add $2x$ ***to both sides:***	$7 = 4x - 7$
Add 7 ***to both sides:***	$14 = 4x$
Divide both sides by 4***:***	$\frac{14}{4} = x$
Make sure the unknown is on the LHS:	$x = 3.5$

2. **(Review of previous material)**

Expand: (a) $5(2x - 7)$ (b) $-3(4x - 9)$

Working: (a) $5(2x - 7) = 10x - 35$

(b) $-3(4x - 9) = -12x + 27$

3. **(Review of previous material)** Solve the equation $7(x + 5) = 40$.

Working:

	$7(x + 5) = 40$
Expand the brackets:	$7x + 35 = 40$
Subtract 35 ***from both sides:***	$7x = 5$
Divide both sides by 7***:***	$x = \frac{5}{7}$

E.g. 1 Solve: (a) $6(3 - 2x) = 56$ (b) $17 = -9(4x - 1)$

Working: (a)

	$6(3 - 2x) = 56$
Expand the brackets:	$18 - 12x = 56$
Add $12x$ ***to both sides:***	$18 = 56 + 12x$
Subtract 56 ***from both sides:***	$-38 = 12x$
Divide both sides by 12***:***	$-\frac{38}{12} = x$
Make sure the unknown is on the LHS:	$x = -\frac{19}{6}$

(b)

	$17 = -9(4x - 1)$
Expand the brackets:	$17 = -36x + 9$
Add $36x$ ***to both sides:***	$17 + 36x = 9$
Subtract 17 ***from both sides:***	$36x = -8$
Divide both sides by 12***:***	$x = -\frac{8}{36} = -\frac{2}{9}$

E.g. 2 Solve: (a) $2(3x-1)=3(x-1)$ (b) $7x=3x-(x+20)$
(c) $4(x-1)=3(2-x)$ (d) $10x-(2x-3)=21$

Working:

(a)

	$2(3x-1)=3(x-1)$
Expand the brackets:	$6x-2=3x-3$
Subtract $3x$ from both sides:	$3x-2=-3$
Add 2 to both sides:	$3x=-1$
Divide both sides by 3:	$x=-\frac{1}{3}$

(b)

	$7x=3x-(x+20)$
	$7x=3x-1(x+20)$
Expand the brackets:	$7x=3x-x-20$
Collect like terms:	$7x=2x-20$
Subtract $2x$ from both sides:	$5x=-20$
Divide both sides by 5:	$x=-4$

(c)

	$4(x-1)=3(2-x)$
Expand the brackets:	$4x-4=6-3x$
Add $3x$ to both sides:	$7x-4=6$
Add 4 to both sides:	$7x=10$
Divide both sides by 7:	$x=\frac{10}{7}$

(d)

	$10x-(2x-3)=21$
	$10x-1(2x-3)=21$
Expand the brackets:	$10x-2x+3=21$
Collect like terms:	$8x+3=21$
Subtract 3 from both sides:	$8x=18$
Divide both sides by 8:	$x=\frac{18}{8}=\frac{9}{4}$

Video: How to solve linear equations with brackets

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p159 M6.2 Qu 1-32 odd
A*-G class textbook:	p149 M6.2 Qu 1-29 odd
9-1 homework book:	p56 M6.2 Qu 1-23
A*-G homework book:	p41 M6.2 Qu 1-21