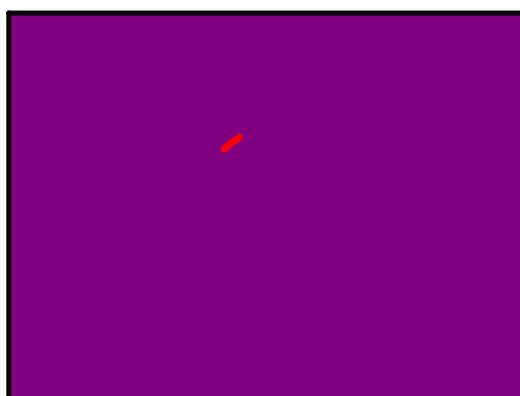
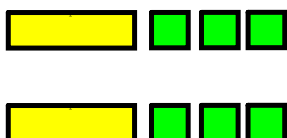


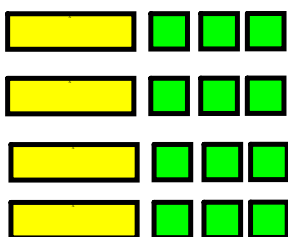
What is the algebraic expression?



How could you describe the expression below?



What about this expression?



How is this related to the diagram above?



**What we just showed is the [Distributive Property](#) in math.**

$4(x + 3)$  means the 4 is distributed to the  $x$  and to the 3, so we get  
 $4x + 4 \times 3$   
 $4x + 12$

Examples: Model and give the answer for the following:

(a)  $3(2x + 1)$

(b)  $2(3x + 2)$

Without modelling:

What we just showed is the Distributive Property in math.

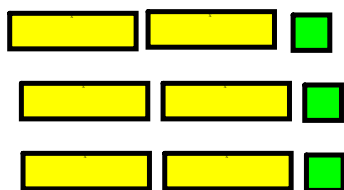
$4(x + 3)$  means the 4 is distributed to the  $x$  and to the 3,

so we get  $4 \times x + 4 \times 3$

$$4x + 12$$

Examples: Model and give the answer for the following:

(a)  $3(2x + 1)$



$$6x + 3$$

(b)  $2(3x + 2)$



$$6x + 4$$

Without modelling:

$$\begin{array}{l} 3(2x+1) \\ 6x+3 \end{array}$$

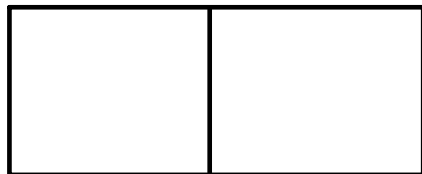
$$\begin{array}{l} 2(3x+2) \\ 6x+4 \end{array}$$

# The Distributive Property

The property stating that a product can be written as a sum or difference of two products.

For example:  $a(b + c) = ab + ac$

$$a(b - c) = ab - ac$$

Box methodMultiply:  $3(x + 4)$ Multiply:  $7(c + 2)$ 

---

$$2(x + 4)$$

$$3(x - 2)$$

Expand:

a)  $-5(x + 7)$

b)  $4(2 - c)$

c)  $-2(-5t + 8)$

d)  $-3(2x - 7)$

Solving Equations that  
Involve the Distributive Property

The Distributive property may also appear in solving equations.

When it does, **first you have to apply the distributive property, then solve as you normally would.**

Solve the following:

# outside Bracket, you multiply  
each term on inside bracket. Then  
solve as usual

(a)  $2(x + 4) = 18$

(b)  $3(x - 5) = 9$

Solving Equations that  
Involve the Distributive Property

The Distributive property may also appear in solving equations.

When it does, **first you have to apply the distributive property, then solve as you normally would.**

Solve the following:

(a)  $2(x + 4) = 18$

(b)  $3(x - 5) = 9$

$$\begin{aligned} \text{a) } 2(x+4) &= 18 \\ 2x+8 &= 18 \\ 2x+8-8 &= 18-8 \\ 2x &= 10 \\ \frac{2x}{2} &= \frac{10}{2} \\ x &= 5 \end{aligned}$$

$\begin{aligned} \text{LS} \\ 2(x+4) \\ \\ 2(6+4) \\ 2 \times 9 \\ 18 \end{aligned}$	$\begin{aligned} \text{RS} \\ 18 \end{aligned}$
--	---

$$\begin{aligned} \text{b) } 3(x-5) - 9 &= 9 \\ 3x - 15 - 9 &= 9 \\ 3x - 24 &= 9 \\ 3x - 24 + 24 &= 9 + 24 \\ 3x &= 33 \\ \frac{3x}{3} &= \frac{33}{3} \\ x &= 11 \end{aligned}$$

$$\begin{aligned} 3x + (-15) + (-9) \\ \text{or } 3x + (-24) \end{aligned}$$

$\begin{aligned} \text{LS} \\ 3(x-5) - 9 \\ 3(11-5) - 9 \\ 3 \times 6 - 9 \\ 18 - 9 \\ 9 \end{aligned}$	$\begin{aligned} \text{RS} \\ 9 \end{aligned}$
---	--





### Word Problem

Ex)

I have 4 friends. We each have a package of cookies and we each have 2 cookies that are not in the package. If we have 50 cookies in total, how many cookies are in each package?

let  $c$  represent  
the package.

hint : How many people?

$$5(c + 2) = 50$$

$$5c + 10 = 50$$

$$5c + 10 - 10 = 50 - 10$$

# Class/Homework

pg. 342 # 4ab,7(a-d),8(a-d),12abc,15

Pg. 347 # 4,5,

Need more practice?? Extra Practice 5  
Worksheet

$$\begin{aligned} 4a) & 7(3+8) \\ & 7(11) \\ & 77 \end{aligned}$$

$$\begin{aligned} & 7 \times 3 + 7 \times 8 \\ & 21 + 56 \\ & 77 \end{aligned}$$

$$\begin{aligned} b) & 5(7-2) \\ & 5 \times 5 \\ & 25 \end{aligned}$$

$$\begin{aligned} & 5 \times 7 - 5 \times 2 \\ & 35 - 10 \\ & 25 \end{aligned}$$

$$7a) 2(x+10) \\ 2x+20$$

$$b) 5(a+1) \\ 5a+5$$

$$c) 10(f+2) \\ 10f+20$$

$$d) 6(12+a) \\ 72+6a$$

$$e) 8(8+y) \\ 64+8y$$

$$f) 5(s+6) \\ 5s+30$$

$$g) 3(9+p) \\ 27+3p$$

$$h) 4(11+r) \\ 44+4r$$

$$i) 7(g+15) \\ 7g+105$$

$$j) 9(7+h) \\ 63+9h$$

$$8a) 3(x-7) \\ 3x-21$$

$$b) 4(a-3) \\ 4a-12$$

$$c) 9(h-5) \\ 9h-45$$

$$d) 7(g-f) \\ 56-7f$$

$$e) 5(l-s) \\ 5-5s$$

$$f) 6(p-2) \\ 6p-12$$

$$g) 8(11-t) \\ 88-8t$$

$$h) 2(15-v) \\ 30-2v$$

$$i) 10(b-8) \\ 10b-80$$

$$j) 11(c-4) \\ 11c-44$$

$$12. \ a) -6(c+4)$$

$$-6c - 24$$

$$c) 10(f-7)$$

$$10f - 70$$

$$e) -8(8-y)$$

$$-64 + 8y$$

$$-64 - (-8y)$$

$$-64 + 8y$$

$$g) -5(-t-8)$$

$$5t + 40$$

$$5t - (-40)$$

$$b) -8(a-5)$$

$$-8a - (-40)$$

$$-8a + 40$$

$$(-8)(-5)$$

$$d) 3(-8-g)$$

$$-24 - 3g$$

$$f) -2(-s+5)$$

$$2s - 10$$

$$h) -9(9-w)$$

$$-81 + 9w$$

$$-81 - (-9w)$$

$$14. \quad 15 \times 25 + 15 \times 14 \quad \text{OR} \quad 15(25 + 14)$$

*Jersey*  
for each
*Hat for*  
each
*(Jersey and*  
*hat Together)*

$$b) \quad 375 + 210$$

$$585$$

$$15(39)$$

$$585$$

$$15k(b)$$

$$5 \times 9 + 5 \times 8$$

$$45 + 40$$

$$85$$

$$\text{OR} \quad 5(9 + 8)$$

$$5(17)$$

$$85$$

pg 347

$$\begin{aligned}
 4a) \quad 3(x+5) &= 36 \\
 3x+15 &= 36 \\
 3x+15-15 &= 36-15 \\
 3x &= 21 \\
 \frac{3x}{3} &= \frac{21}{3} \\
 x &= 7
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 3(x+5) \\
 3(7+5) \\
 3 \times 12 \\
 36
 \end{array}
 \qquad
 \begin{array}{l}
 \text{RS} \\
 36
 \end{array}$$

$$\begin{aligned}
 b) \quad 4(p-6) &= 36 \\
 4p-24 &= 36 \\
 4p-24+24 &= 36+24 \\
 4p &= 60 \\
 \frac{4p}{4} &= \frac{60}{4} \\
 p &= 15
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 4(p-6) \\
 4(15-6) \\
 4 \times 9 \\
 36
 \end{array}
 \qquad
 \begin{array}{l}
 \text{RS} \\
 36
 \end{array}$$

$$\begin{aligned}
 c) \quad 5(y+2) &= 25 \\
 5y+10 &= 25 \\
 5y+10-10 &= 25-10 \\
 5y &= 15 \\
 \frac{5y}{5} &= \frac{15}{5} \\
 y &= 3
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 5(y+2) \\
 5(3+2) \\
 5 \times 5 \\
 25
 \end{array}
 \qquad
 \begin{array}{l}
 \text{RS} \\
 25
 \end{array}$$

$$\begin{aligned}
 d) \quad 10(a+8) &= 30 \\
 10a+80 &= 30 \\
 10a+80-80 &= 30-80 \\
 10a &= -50 \\
 \frac{10a}{10} &= \frac{-50}{10} \\
 a &= -5
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 10(a+8) \\
 10(-5+8) \\
 10 \times 3 \\
 30
 \end{array}
 \qquad
 \begin{array}{l}
 \text{RS} \\
 30
 \end{array}$$



$$\begin{aligned}
 5a) \quad & -2(a+4) = 18 \\
 & -2a - 8 = 18 \\
 & -2a - 8 + 8 = 18 + 8 \\
 & -2a = 26 \\
 & \frac{-2a}{-2} = \frac{26}{-2} \\
 & a = -13
 \end{aligned}$$

$$-2a + (-8)$$

$$\begin{array}{ll}
 \text{LS} & \text{RS} \\
 -2(a+4) & 18 \\
 -2(-13+4) & \\
 -2 \times -9 & \\
 18 & 
 \end{array}$$

$$\begin{aligned}
 b) \quad & -3(r-5) = -27 \\
 & -3r + 15 = -27 \\
 & -3r + 15 - 15 = -27 - 15 \\
 & -3r = -42 \\
 & \frac{-3r}{-3} = \frac{-42}{-3} \\
 & r = +14
 \end{aligned}$$

$$\begin{array}{ll}
 \text{LS} & \text{RS} \\
 -3(r-5) & -27 \\
 -3(14-5) & \\
 -3 \times 9 & \\
 -27 & 
 \end{array}$$

$$\begin{aligned}
 c) \quad & 7(-y+2) = 28 \\
 & -7y + 14 = 28 \\
 & -7y + 14 - 14 = 28 - 14 \\
 & -7y = 14 \\
 & \frac{-7y}{-7} = \frac{14}{-7} \\
 & y = -2
 \end{aligned}$$

$$-y$$

$$-(-2)$$

$$\begin{array}{ll}
 \text{LS} & \text{R} \\
 7(-y+2) & 28 \\
 7(-1(-2)+2) & \\
 7(2+2) & \\
 7 \times 4 & \\
 28 & 
 \end{array}$$

$$\begin{aligned}
 d) \quad & -6(c-9) = -42 \\
 & -6c - (-54) = -42 \\
 & -6c - (-54) + (-54) = -42 + (-54) \\
 & -6c = -96 \\
 & \frac{-6c}{-6} = \frac{-96}{-6} \\
 & c = 16
 \end{aligned}$$

$$\begin{aligned}
 -6c + 54 & = -42 \\
 -6c + 54 - 54 & = -42 - 54 \\
 -6c & = -96
 \end{aligned}$$

$$\begin{array}{ll}
 \text{LS} & \text{R} \\
 -6(c-9) & -42 \\
 -6(16-9) & \\
 -6 \times 7 & \\
 -42 & 
 \end{array}$$

Sheet Ex Prac 5

$$1) 5(a+2) = -5$$

$$5a + 10 = -5$$

$$5a + 10 - 10 = -5 - 10$$

$$5a = -15$$

$$\frac{5a}{5} = \frac{-15}{5}$$

$$a = -3$$

verify

LS	RS
$5(a+2)$	$-5$
$5(-3+2)$	
$5 \times -1$	
$-5$	

$$b) 4(p-6) = -4$$

$$4p - 24 = -4$$

$$4p - 24 + 24 = -4 + 24$$

$$4p = 20$$

$$\frac{4p}{4} = \frac{20}{4}$$

$$p = 5$$

LS	RS
$4(p-6)$	$-4$
$4(5-6)$	
$4 \times -1$	
$-4$	

$$c) 10(y+3) = 10$$

$$10y + 30 = 10$$

$$10y + 30 - 30 = 10 - 30$$

$$10y = -20$$

$$\frac{10y}{10} = \frac{-20}{10}$$

$$y = -2$$

LS	RS
$10(y+3)$	$10$
$10(-2+3)$	
$10 \times 1$	
$10$	

$$d) 7(r-6) = 7$$

$$7r - 42 = 7$$

$$7r - 42 + 42 = 7 + 42$$

$$7r = 49$$

$$\frac{7r}{7} = \frac{49}{7}$$

$$r = 7$$

LS	RS
$7(r-6)$	$7$
$7(7-6)$	
$7 \times 1$	
$7$	

$$\begin{aligned}
 2a) -7(b+6) &= -84 \\
 -7b - 42 &= -84 \\
 -7b - 42 + 42 &= -84 + 42 \\
 -7b &= -42 \\
 \frac{-7b}{-7} &= \frac{-42}{-7} \\
 b &= +6
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 -7(b+6) \\
 -7(b+6) \\
 -7 \times 12 \\
 -84 \\
 \text{RS} \\
 -84
 \end{array}$$

$$\begin{aligned}
 b) -5(g-11) &= 70 \\
 -5g + 55 &= 70 \\
 -5g + 55 - 55 &= 70 - 55 \\
 -5g &= 15 \\
 \frac{-5g}{-5} &= \frac{15}{-5} \\
 g &= -3
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 -5(g-11) \\
 -5(-3-11) \\
 -5 \times -14 \\
 70 \\
 \text{RS} \\
 70
 \end{array}$$

$$\begin{aligned}
 c) -9(d-3) &= -45 \\
 -9d + 27 &= -45 \\
 -9d + 27 - 27 &= -45 - 27 \\
 -9d &= -72 \\
 \frac{-9d}{-9} &= \frac{-72}{-9} \\
 d &= +8
 \end{aligned}$$

$$\begin{array}{l}
 \text{LS} \\
 -9(d-3) \\
 -9(8-3) \\
 -9 \times 5 \\
 -45 \\
 \text{RS} \\
 -45
 \end{array}$$

$$\begin{aligned}
 d) -6(f-5) &= 36 \\
 -6f + 30 &= 36 \\
 -6f + 30 - 30 &= 36 - 30 \\
 -6f &= 6 \\
 \frac{-6f}{-6} &= \frac{6}{-6} \\
 f &= -1
 \end{aligned}$$

3  $p = \text{price of voucher}$

$$5(8+p) = 55$$

$$40 + 5p = 55$$

$$40 + 5p - 40 = 55 - 40$$

$$5p = 15$$

$$\frac{5p}{5} = \frac{15}{5}$$

$$p = 3$$

The ice cream voucher was \$3

$$\begin{array}{l} \text{LS} \\ 5(8+p) \\ 5(8+3) \\ 5 \times 11 \\ 55 \end{array} \qquad \begin{array}{l} \text{RS} \\ 55 \end{array}$$

4.

$$\boxed{\text{Per} = 54} \quad 12$$

$m$

$m = \text{length of plot}$

$$m + 12 + m + 12 = 54$$

$$2m + 24 = 54$$

$$2m + 24 - 24 = 54 - 24$$

$$2m = 30$$

$$\frac{2m}{2} = \frac{30}{2}$$

$$m = 15$$

The length is 15m.

$$2(m+12) = 54$$

$$\begin{array}{l} \text{LS} \\ m+12 + m+12 \\ 15+12 + 15+12 \\ 54 \end{array} \qquad \begin{array}{l} \text{RS} \\ 54 \end{array}$$

5.  $n =$  the number

$$-4(n+9) = -16$$

$$-4n + -36 = -16$$

$$-4n + 36 - (36) = -16 - (-36)$$

$$-4n = 20$$

$$\frac{-4n}{-4} = \frac{20}{-4}$$

$$n = -5$$

The integer was  $-5$

$$-4n - 36 = -16$$

$$-4n - 36 + 36 = -16 + 36$$

$$-4n = 20$$

LS

$$-4(n+9)$$

$$-4(-5+9)$$

$$-4 \times 4$$

$$-16$$

RS

$$-16$$