Ailgéabar

Fadhb an Bhosca Airgid

Fadhb i bhFocail

$y = mx + b$
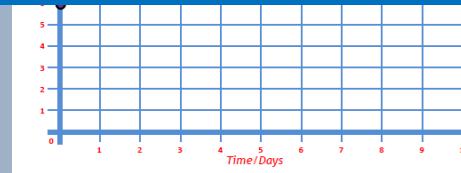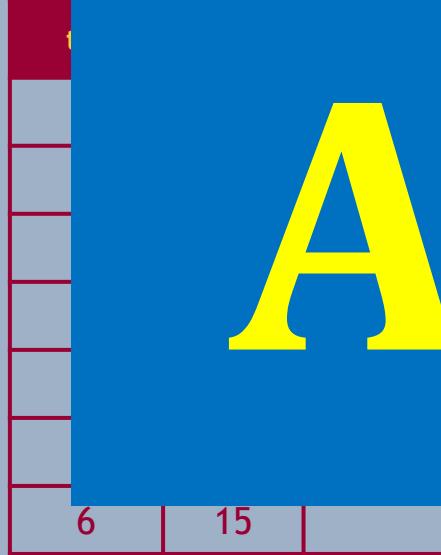
Fadhb na Lusanna Gréine

Athróga

| 6 | 15 | |

Project Maths
Tionscadal Mata

Ba chóir go mbeadh na scoláirí in ann

– samhlacha a imscrúdú, mar shampla miondealú, co... a shocrú ina n... cóimhéid a ch... as na hoibríoch... dealú, iolrú, ag... freagra in **N**

– airíonna na huimhríochta a imscrúdú, cómhalartach, comhthiomsaitheach agus dáileach agus na gaolta idir oibríochtaí, lena n-áirítear oibríocht inbhéartach

– ord oibríochtaí a thuiscint, lena n-áirítear lúibíní

– samhlacha ar nós na huimhirlíne a imscrúdú chun na hoibríochtaí seo a leanas – suimiú, dealú, iolrú agus roinnt – a léiriú in **Z**

– breathnuithe oibríochtaí uimhríochtúla a ghinearálú

– samhlacha a imscrúdú le cabhrú le scoláirí a machnamh a dhéanamh
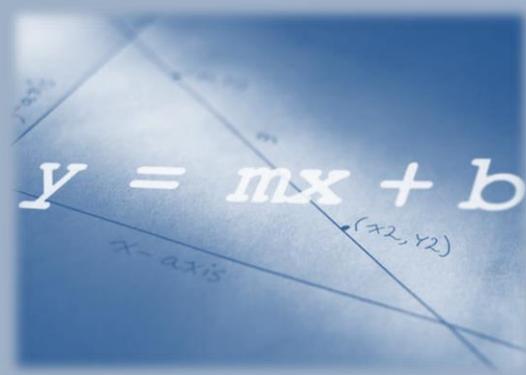
Ba chóir go mbeadh na scoláirí in ann

– táblaí a úsáid chun suíomh lena mbaineann patrún

... ...lú agus a mhíniú i ... ... le haghaidh téarmaí ...dí agus graif mar uirlisí chun patrúin agus coibhnis a léiriú agus chun anailís a dhéanamh orthu

– a gcuid straitéisí agus smaointe féin maidir le ginearálú a fhorbairt agus a úsáid mar aon le straitéisí daoine eile a mheas

– réitigh a chur i láthair agus a léirmhíniú, ag míniú agus ag fírinniú modhanna, tátal agus réasúnú

– an fhoirmle, scríofa i bhfocail, as a ndíorthaítear na sonraí, a fháil. (coibhnis líneacha)

– **an fhoirmle as a ndíorthaítear na sonraí a fháil go hailgéabrach (coibhnis líneacha, chearnacha)**

– a thaispeáint go bhfuil gnéithe ag coibhnis is féidir a léiriú ar shlite éagsúla

13 x 16: Iolrú Fada

Samhail An Eagair

$13 \times 16 = (10 + 3) \times (10 + 6)$

$= 100 + 60 + 30 + 18$

$= 208$

1 Garmheastacháin

2. Miondealaigh na fachtóirí

3. Lípéadaigh samhail an eagair

4. Dlí an Dáilte

	10	**3**
10	100	30
6	60	18

$y = mx + b$
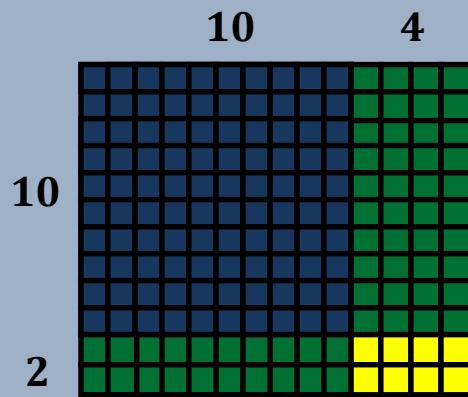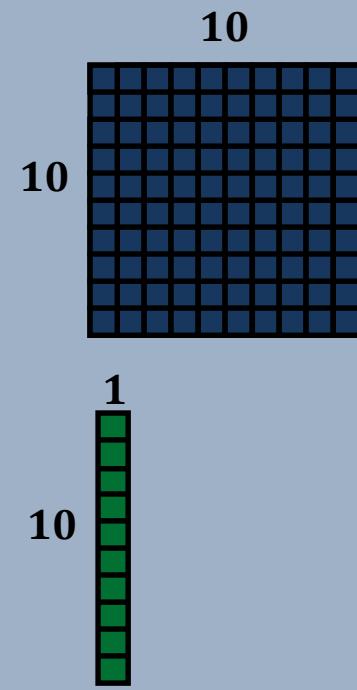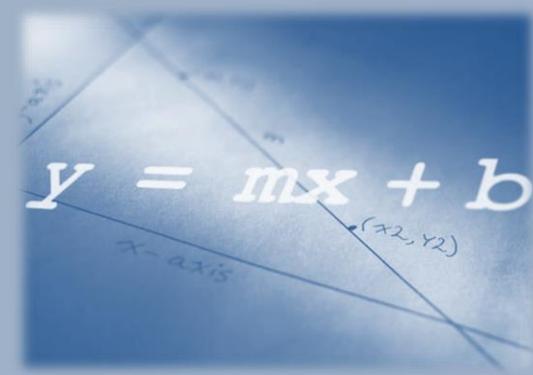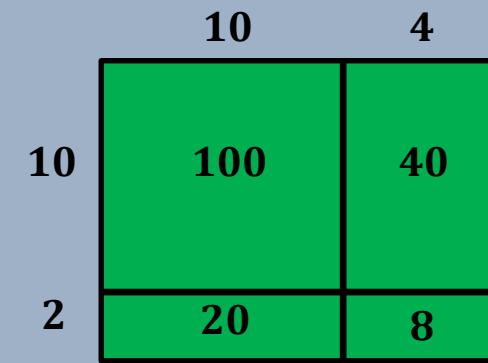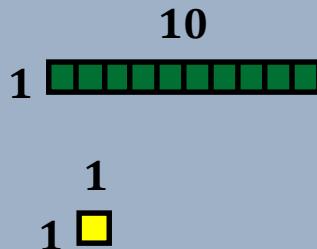
Gin Léirshamhlacha Eagair ag baint úsáide as Uimhreacha mar Réamhléiriú

$y = mx + b$

10

10

10

1

10

10

1

1

10

1

10   4

10

2

Achar iomlán $= 10 \times 10 + 10 \times 4 + 2 \times 10 + 2 \times 4$
$= 100 + 40 + 20 + 8$
$= 168$

10   4

10   **100**   **40**

2   **20**   **8**
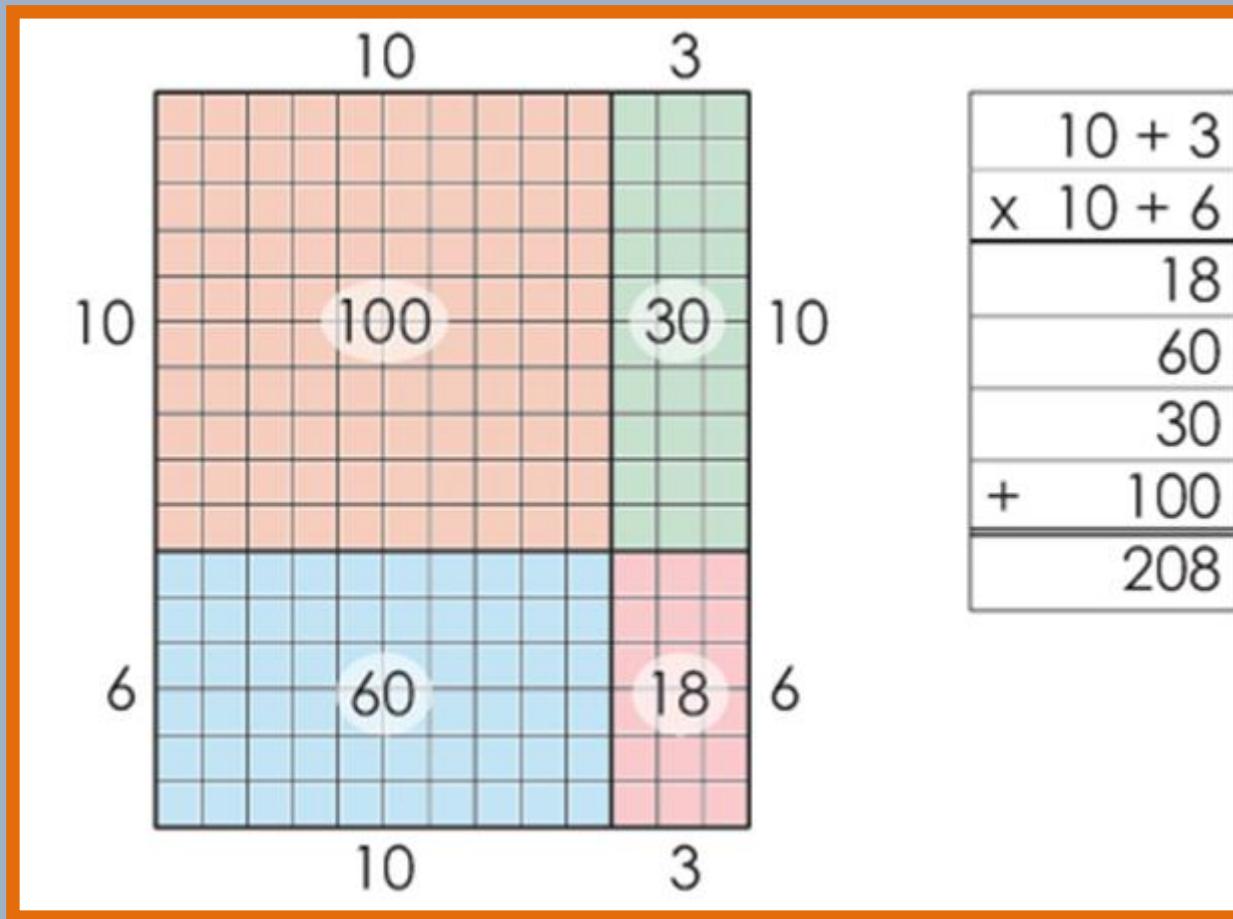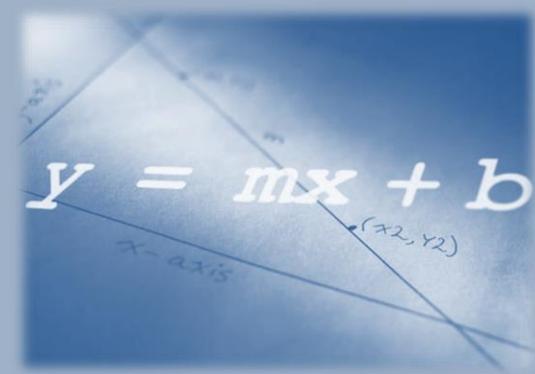
Achar iomlán $= 100 + 40 + 20 + 8$
$= 168$

Seiceáil

$$\begin{array}{r} 14 \\ \times\ 12 \\ \hline 168 \end{array}$$

Project Maths
Tionscadal Mata
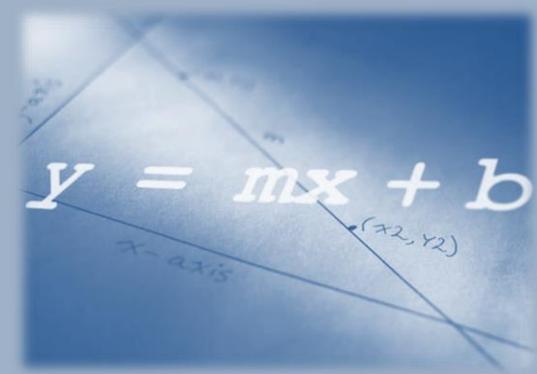
Samhail An Eagair

Samhail An Eagair

Iolraigh $(x + 2)$ **ar** $(x + 4)$

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

$$= x^2 + 4x + 2x + 8$$
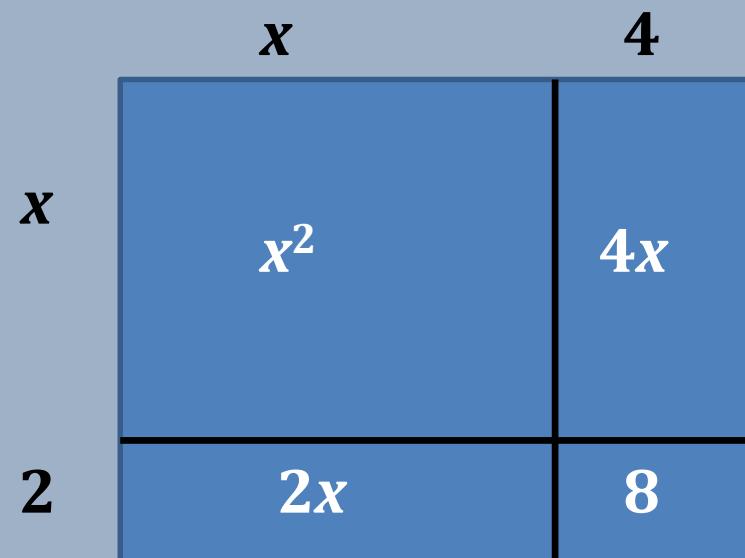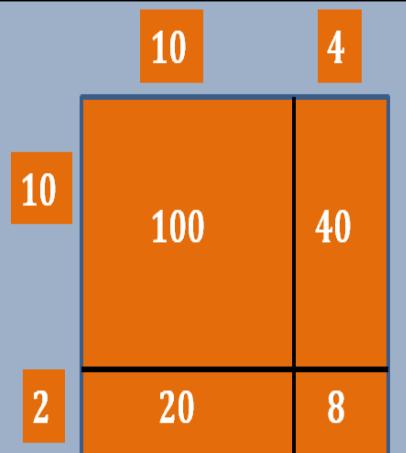
$$= x^2 + 6x + 8$$

**Do Shampla Féin**

$$12 \times 14 = (10 + 2) \times (10 + 4)$$
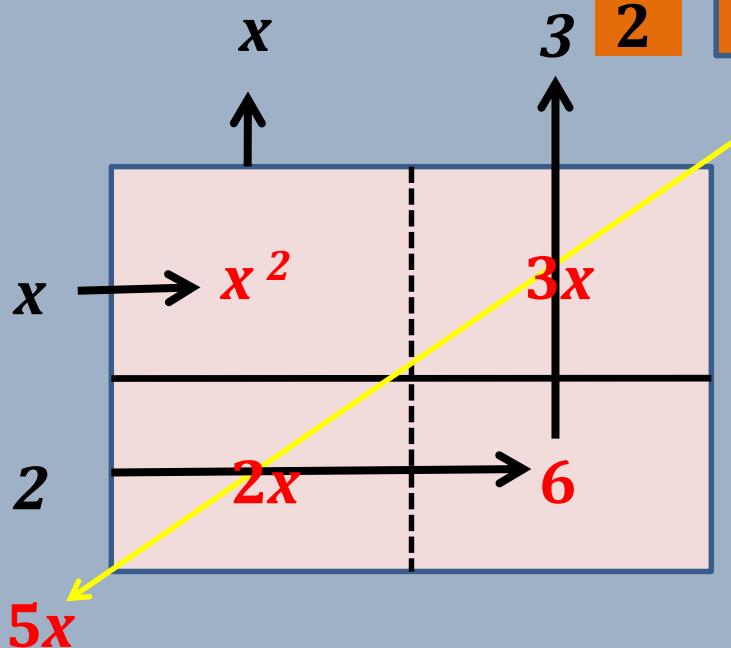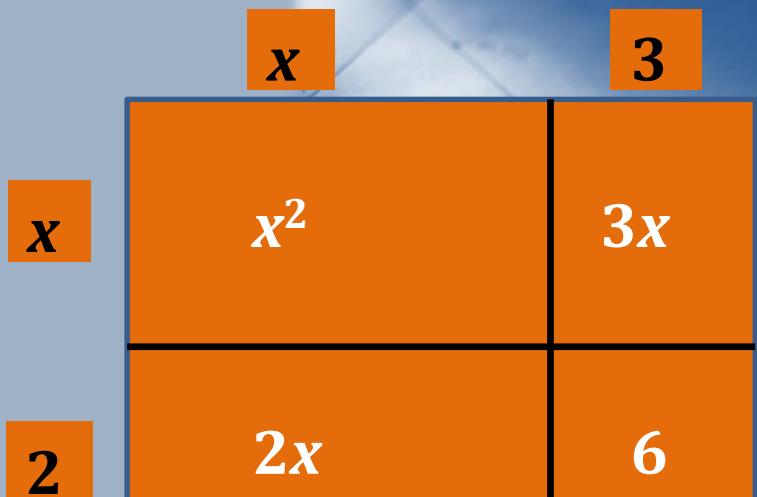
$$= 100 + 40 + 20 + 8$$

$$= 168$$

Roinn Fhada

Roinn x^2 + 5x + 6 ar x + 2

	x	3
x	x^2	$3x$
2	$2x$	6
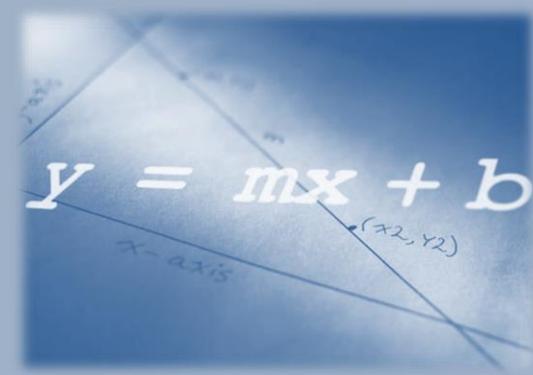
Seiceáil

3x + 2x = 5x

Dlí an Dáilte
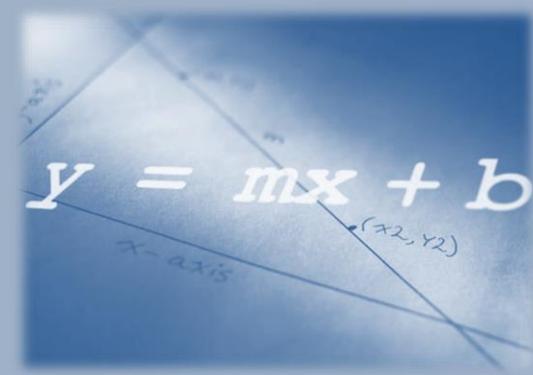
Iolraigh: $(x - 2)(x^2 - 2x + 3)$

	x^2	$-2x$	$+3$
x	x^3	$-2x^2$	$+3x$
-2	$-2x^2$	$+4x$	-6

Iomlán Achar $= x^3 - 2x^2 - 2x^2 + 3x + 4x - 6$

$= x^3 - 4x^2 + 7x - 6$

Dlí an Dáilte
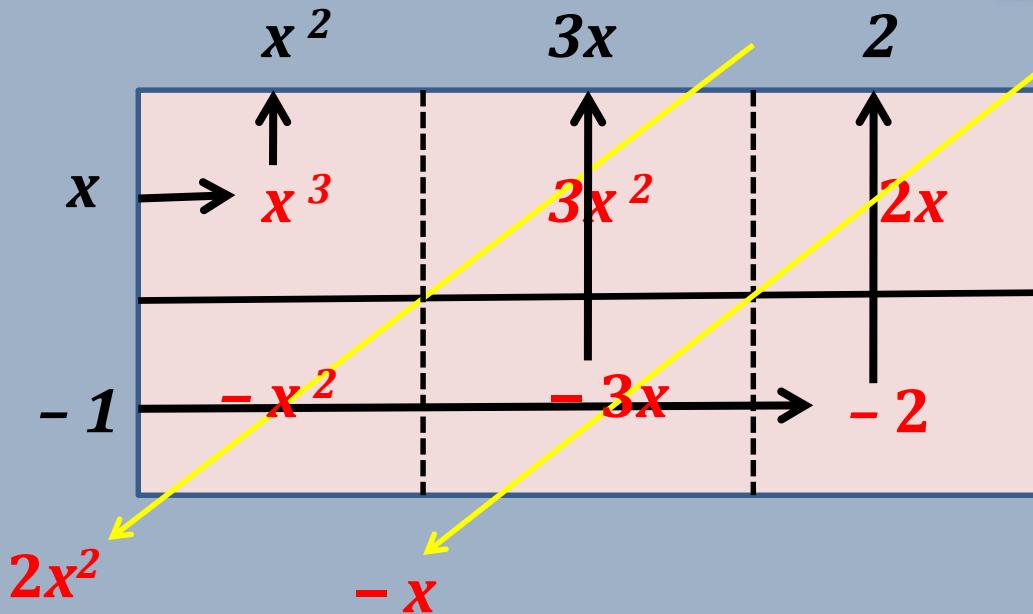
Iolraigh $(x - 1)(x^2 + 3x + 2)$

	x^2	$+3x$	$+2$
x	x^3	$+3x^2$	$+2x$
-1	$-x^2$	$-3x$	-2

$$= x^3 + 2x^2 - x - 2$$

Roinn $x^3 + 2x^2 - x - 2$ **ar** $x - 1$

	x^2	$+3x$	$+2$
x	x^3	$+3x^2$	$+2x$
-1	$-x^2$	$-3x$	-2

x^2 $3x$ 2

x x^3 $3x^2$ $2x$

-1 $-x^2$ $-3x$ -2

$2x^2$ $-x$

Seiceáil

$3x^2 - x^2 = 2x^2$ 2x -3x = -x

Project Maths
Tionscadal Mata

(c) Is fachtóir é $(x - a)^2$ de $2x^3 - 5ax^2 + 8abx - 36a$ áit $a \neq 0$
Faigh na luachanna a d'fhéadfadh a bheith ar a agus b.

$(x - a)^2 = x^2 - 2ax + a^2$

Tá an téarma seo 2x mar sin tá an toradh seo $2x^3$

Tá an téarma seo $-\dfrac{36}{a}$

Mar sin, tá an toradh $-36a$

Caithfimid an 3ú fhachtóir a fháil

	x^2	$-2ax$	$+a^2$
$2x$	$2x^3$	$-4ax^2$	$2a^2x$
$-\dfrac{36}{a}$	$-\dfrac{36\ x^2}{a}$	$72x$	$-36a$

$-4ax^2 + -\dfrac{36\ x^2}{a} = -5ax^2$

$-4a + \dfrac{-36}{a} = -5a$

$-4a^2 + -36 = -5a^2$

$a^2 = 36$

$a = \pm 6$

$2a^2x + 72x = 8abx$

$a^2 + 36 = 4ab$

Má tá a = 6

$(6)^2 + 36 = 4(6)b$

$72 = 24b$

$b = 3$

Má tá a = -6

$(-6)^2 + 36 = 4(-6)b$

$72 = -24b$

$b = -3$

$a = \pm 6$ and $b = \pm 3$

Project Maths
Tionscadal Mata

# Gníomhaíocht: Léirshamhail Achair le hUimhreacha

$y = mx + b$
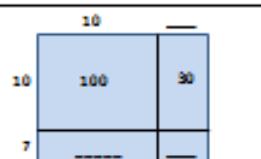
Fill in the answers to the following multiplication sums using array models

1. $13 \times 17 = (10 + \underline{}) \times (10 + \underline{})$
   $= 100 + 30 + \underline{} + \underline{}$
   $= 221$
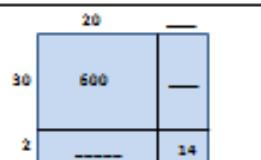
	10	___
10	100	30
7	_____	__

2. $27 \times 32 = (20 + \underline{}) \times (30 + \underline{})$
   $= \underline{} + \underline{} + \underline{} + \underline{}$
   $= \underline{}$

	20	___
30	600	__
2	_____	14

3. $35 \times 41 = (\underline{} + 5) \times (\underline{} + 1)$
   $= \underline{} + \underline{} + \underline{} + \underline{}$
   $= \underline{}$

	30	___
40	__	200
__	30	__

4. $22 \times 15 =$

5. $27 \times 41 =$

Find the answers to the following multiplication sums using the Distributive Law, then check your answer using an area model.   Name:

Example
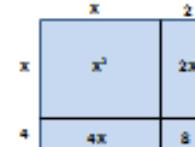
$= (x + 2)(x + 4)$

$x(x + 4) + 2(x + 4)$

$= x^2 + 4x + 2x + 8$

$= x^2 + 6x + 8$

CHECK WORK USING AN AREA MODEL

	x	2
x	x^2	$2x$
4	$4x$	8
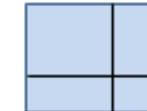
→ PLEASE USE THE ARROWS IN YOUR WORK

1. $(x + 5)(x + 3)$
   $=$
   $=$
   $=$

2. $(a + 1)(a + 7)$

   $=$
   $=$
   $=$

4. $(x + y)(x + y)$
   $=$
   $=$

Sleachta as na Bileoga Oibre seo ar leathanach 23

Project Maths

Bileoga Oibre Acmhainne

Solution Strategies for Multiplication   Name_____

1. **Story:** 4 students have 5 balloons each. How many balloons do they have between them in total? Please use 3 different ways to represent your answer – *Diagram, Arithmetic Sentence and Words.*

Diagram

Arithmetic Sentence
(ex. 5 × 8)

Words
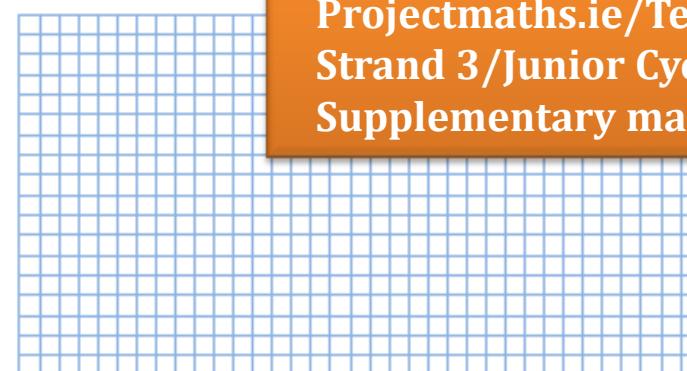
2. **Story:** A chef bought 15 boxes of a dozen eggs to make deserts for a wedding meal. How many eggs did he buy in total? Please use arrays to represent this answer in a diagram.

Diagram using arrays

3. Now, represent the number of eggs the chef bought again, this time using graph paper.

4. Is it still taking too long? Try to find a ...

5. State if the following Arithmetic Sentences are true or false (T/F). Use your diagrams to help you.

a. 15×12 *is the same as* $(5 \times 12) + (5 \times 12) + (5 \times 12)$ _____
b. 15×12 *is the same as* $(10 \times 15) + (2 \times 15)$ _____
c. $15 \times 12 = (8 \times 12) + (7 \times 12)$ _____
d. $15 \times 12 = (10 \times 12) \times (5 \times 12)$ _____
e. $15 \times 12 = (10 \times 12) + (5 \times 12)$ _____
f. $15 \times 12 = (10 \times 10) + (5 \times 2)$ _____
g. $15 \times 12 = (15 \times 10) + (15 \times 2) = 15 \times (10 + 2)$ _____

Bileoga Oibre le Nótaí do Mhúinteoirí

Projectmaths.ie/Teachers/ Strand 3/Junior Cycle/ Supplementary material

Fachtóiriú: Dlí an Dáilte

TS: Sloinn Líneacha & Chearnacha

4 Mhodh le Fachtóiriú

1. Comhfhachtóir a bhaint amach
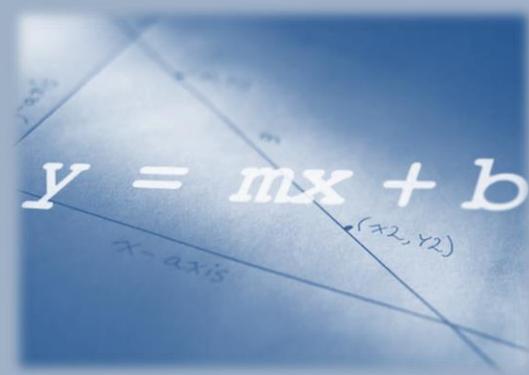
2. Grúpáil

3. Sloinn chearnacha: $ax^2 + bx + c$

   $ax^2 + bx$

   $ax^2 + c$

   D'fhéadfadh a, b, c a bheith ionann
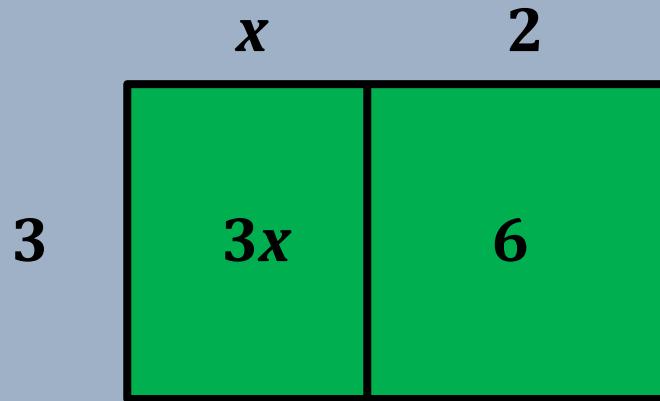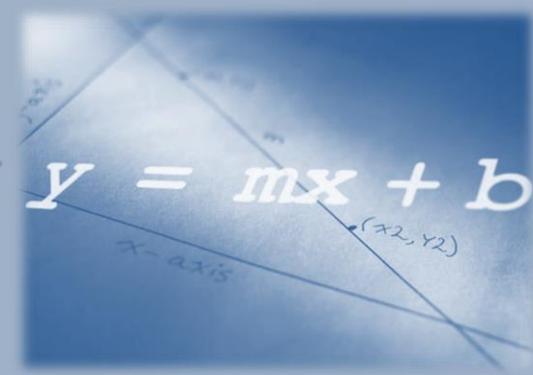
4. Difríocht Dhá Chearnóg

3(x + 2)	3x + 6
(a - c)(b + d)	ab + ad – bc - cd
(2x +3)(x – 7)	$2x^2 – 11x - 21$
(x + y)(x – y)	$x^2 - y^2$

1. Comhfhachtóir a bhaint amach

Fachtóirigh   3x + 6

x 2

3

3x 6
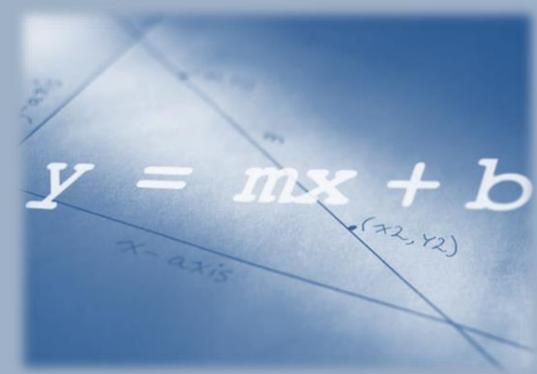
Is iad na fachtóirí ná 3 (x + 2)

Gníomhaíocht

2. Grúpáil

Fachtóirigh *ab – bc + da – dc*
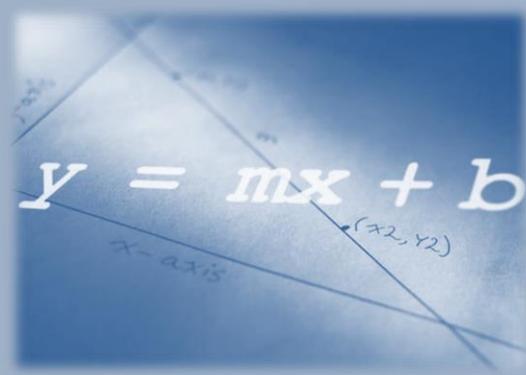
	a	$-c$
b	ab	$-bc$
d	da	$-dc$

Is iad na fachtóirí ná (b +d) (a – c)

Gníomhaíocht
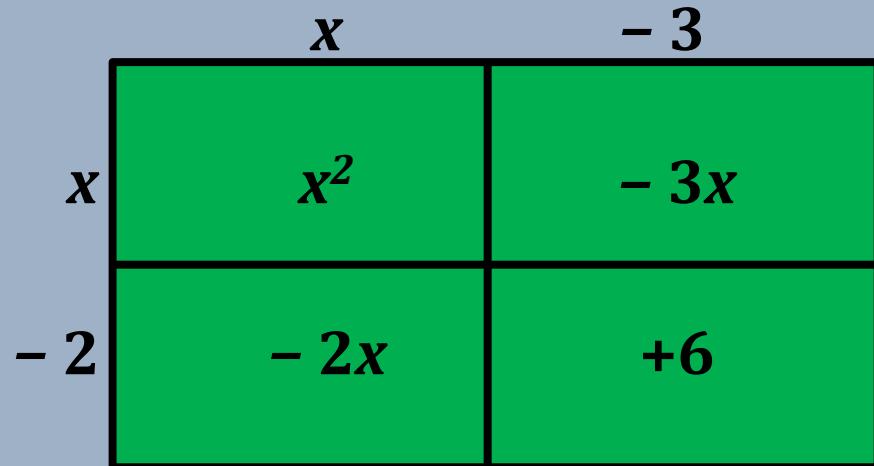
Leathnach 27

Athúsáid an Modh Grúpála

+6

6×1

-6×-1

3×2

-3×-2
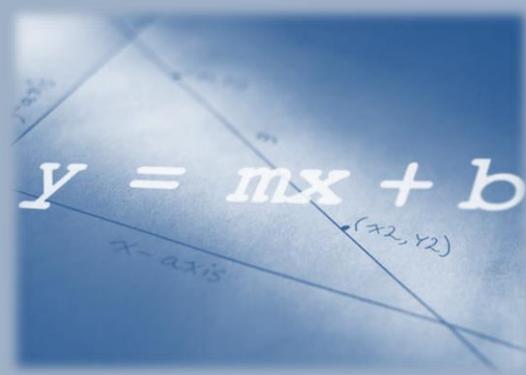
$x^2 - 5x + 6$

	x	-3
x	x^2	$-3x$
-2	$-2x$	$+6$

Comhéifeachtaí x^2 níos mó ná 1

-42

$$\pm \begin{cases} 1 \times 42 \\ 2 \times 21 \\ 3 \times 14 \\ 6 \times 7 \end{cases}$$

$2x^2 - 11x - 21$

	x	$- 7$
$2x$	$2x^2$	$- 14x$
$+3$	$+3x$	$- 21$

$y = mx + b$

Gníomhaíocht **Leathnach: 28**

Project Maths
Tionscadal Mata

$10^2 - 3^2$

3^2

$\leftarrow 10 - 3 \rightarrow$

10

B 10^2

A

$10 - 3$

$\leftarrow 3 \rightarrow$
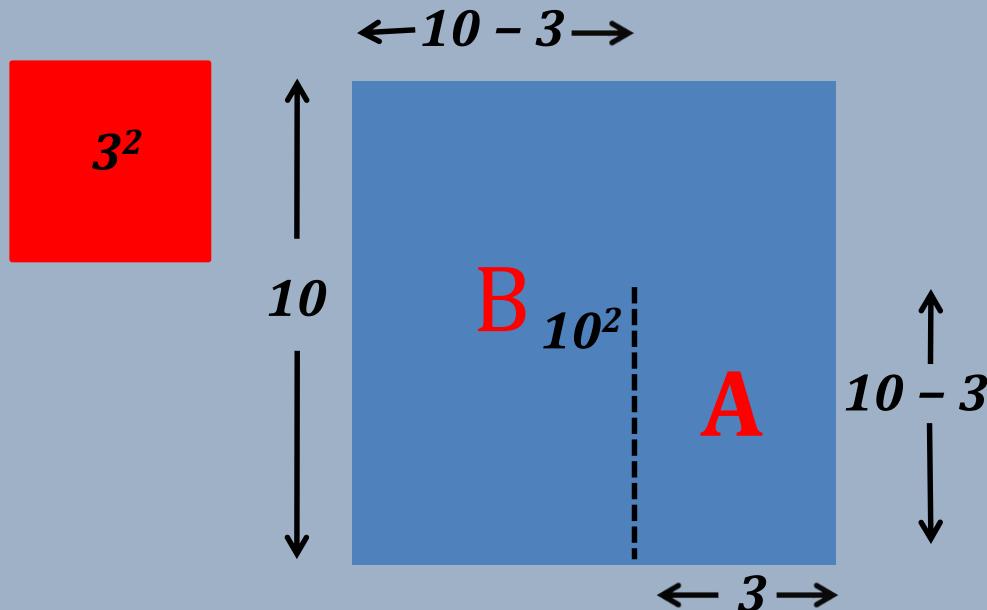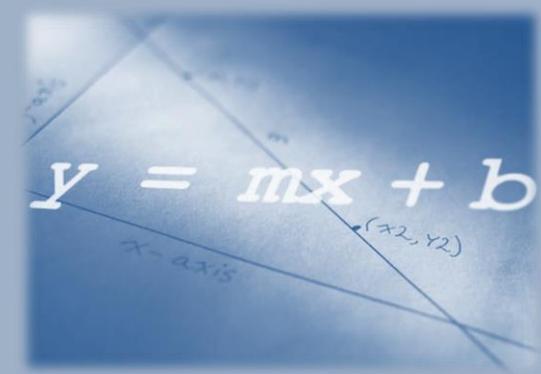
Achar A = $3(10 - 3)$

Achar B = $10(10 - 3)$
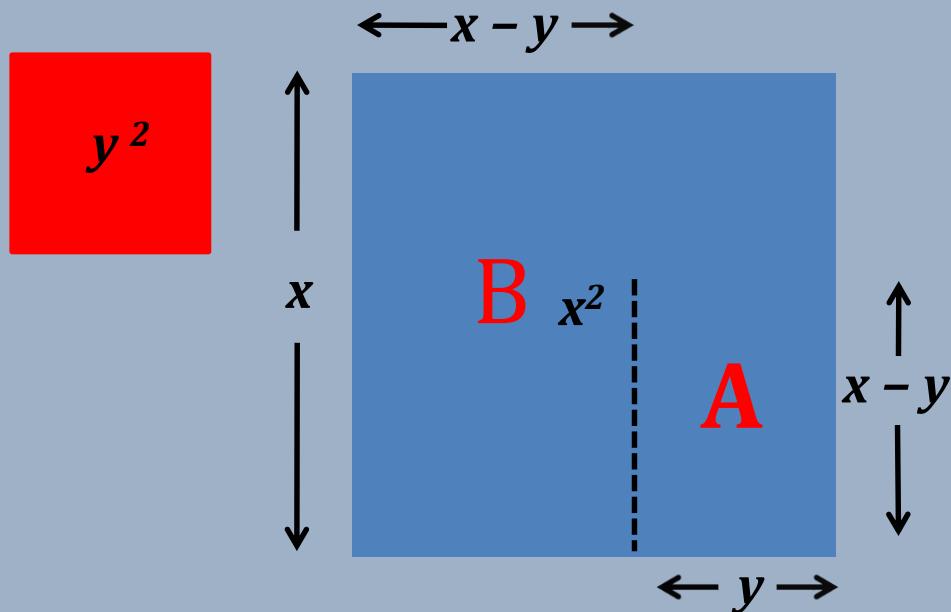
Achar A + B = $3(10 - 3) + 10(10 - 3)$
$= (10 - 3)(10 + 3) = 91$

4. Difríocht Dhá Chearnóg

Fachtóirigh $x^2 - y^2$
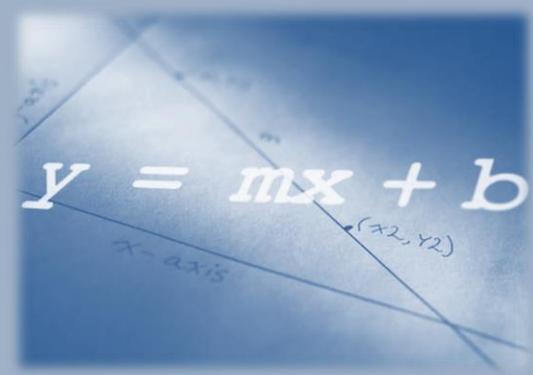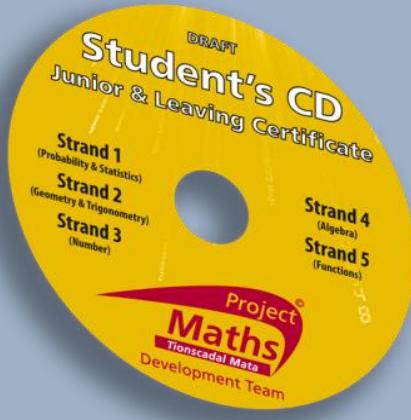
Achar A $= y(x - y)$

Achar B $= x(x - y)$
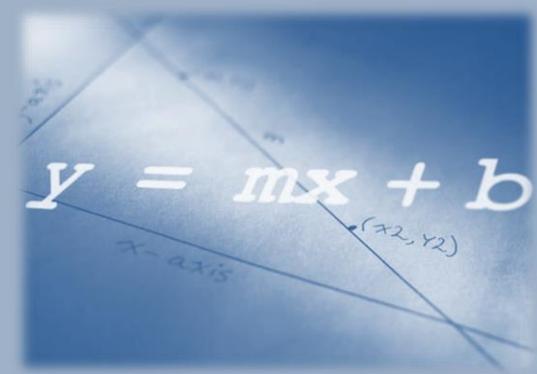
Achar A + B $= y(x - y) + x(x - y)$
$= (x - y)(x + y)$
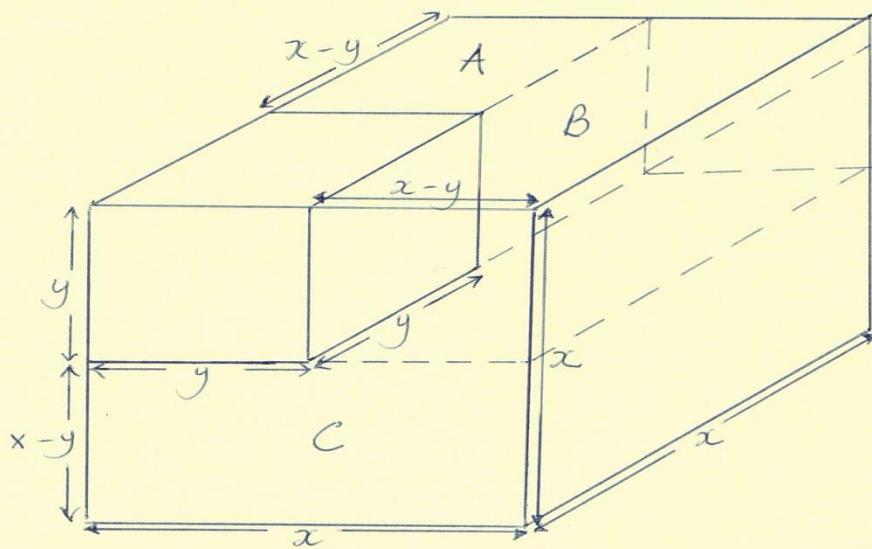
CD an Scoláire: Léiriú ar an Difríocht idir dhá Chearnóg Quiz

Ceist le machnamh uirthi.....
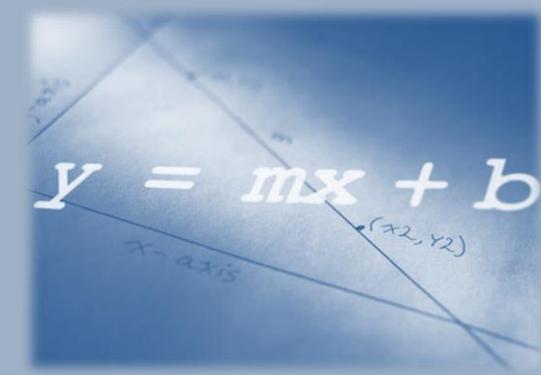
An féidir leat léirshamhail a tharraingt don difríocht idir dhá chiúb?

Difference of 2 Cubes.

$$x^3 - y^3 = \text{Volume } A + \text{Volume } B + \text{Volume } C$$

$$= \left[y \times y \times (x-y) \right] + \left[x \times y \times (x-y) \right] + \left[x \times x \times (x-y) \right]$$

$$= y^2(x-y) + xy(x-y) + x^2(x-y)$$

$$= (x-y)(y^2 + xy + x^2)$$

OR

$$= (x-y)(x^2 + xy + y^2)$$

$y = mx + b$

Réiteach Fadhbanna

Siollabas

Foghlaimíonn na scoláirí	Beidh na scoláirí in ann
1.8 Sintéis agus réiteach fadhbanna	− patrúin a chíoradh agus buillí faoi thuairim a fhoirmliú − torthaí a mhíniú − údar a thabhairt le tátail − matamaitic a chur in iúl ó bhéal agus i scríbhinn − a gcuid eolais agus scileanna a chur i bhfeidhm chun fadhbanna a réiteach i gcomhthéacsanna a bhfuil taithí acu orthu agus i gcomhthéacsanna nach bhfuil taithí acu orthu − anailís a dhéanamh ar fhaisnéis a chuirtear ina láthair i bhfocail agus í a aistriú go foirm mhatamaiticiúil − samhlacha, foirmlí nó teicnící matamaiticiúla cuí a cheapadh, a roghnú agus a úsáid chun faisnéis a phróiseáil agus chun tátail ábhartha a bhaint

Scrúdu

Ag gach ceann de na trí leibhéal (AL, GL, BL), ceisteanna ar chuma réiteach fadhbanna a bheidh i Roinn B.

New Problem Solving Tab on Projectmaths.ie

Leathanach Fadhbanna Lch. 26

Cuir 6 le *n*, ansin roinn ar dó

W 4

n	Ans
1	
2	4
3	
4	5

$$\frac{1}{2}$$ | n | 6 |

E1

$$\frac{n+6}{2}$$

E10

$$\frac{n}{2}+3$$

G1

Tionscadal Mata
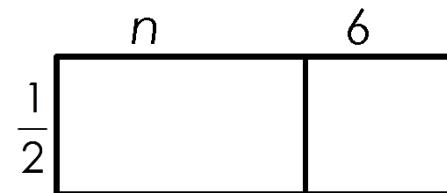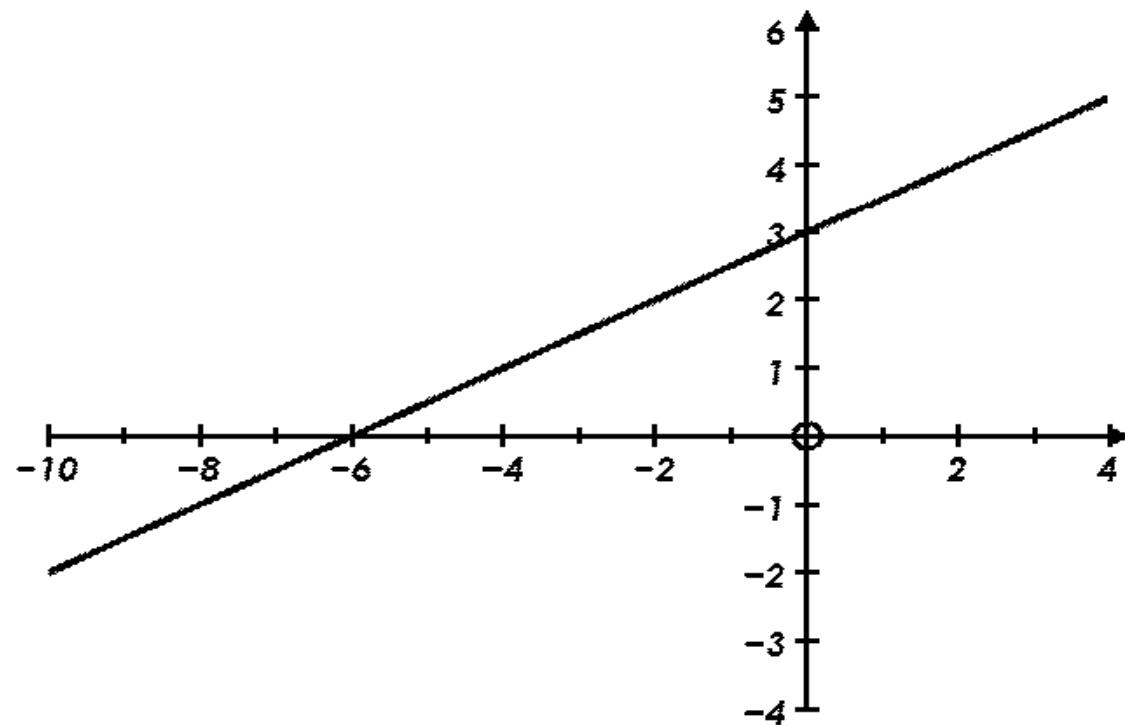
Cearnaigh *n*, ansin méadaigh faoi 9

n	Ans
1	
2	
3	81
4	144

$$(3n)^2$$
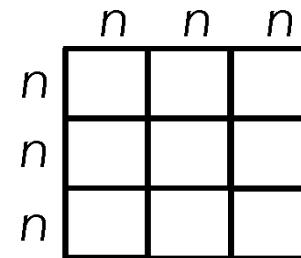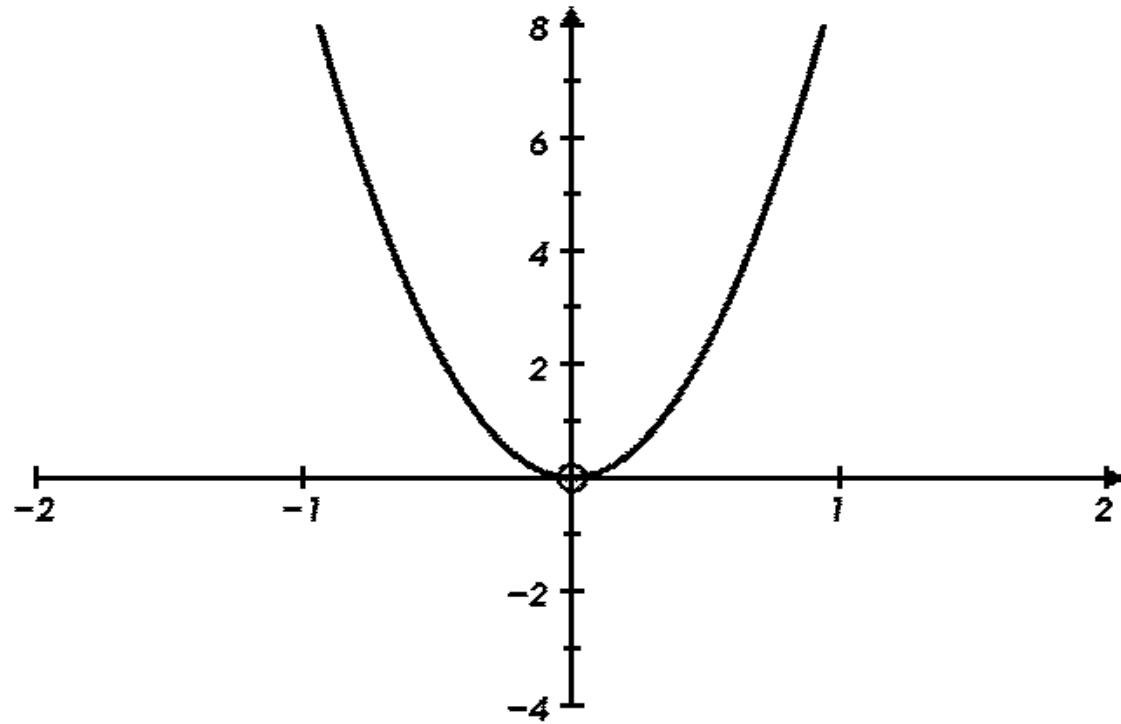
G2

Méadaigh *n* faoi dó, ansin cuir sé leis

W1

Cuir trí le *n*, ansin méadaigh faoi dó.

W5

E4

$$2n + 6$$

E5

$$2(n + 3)$$
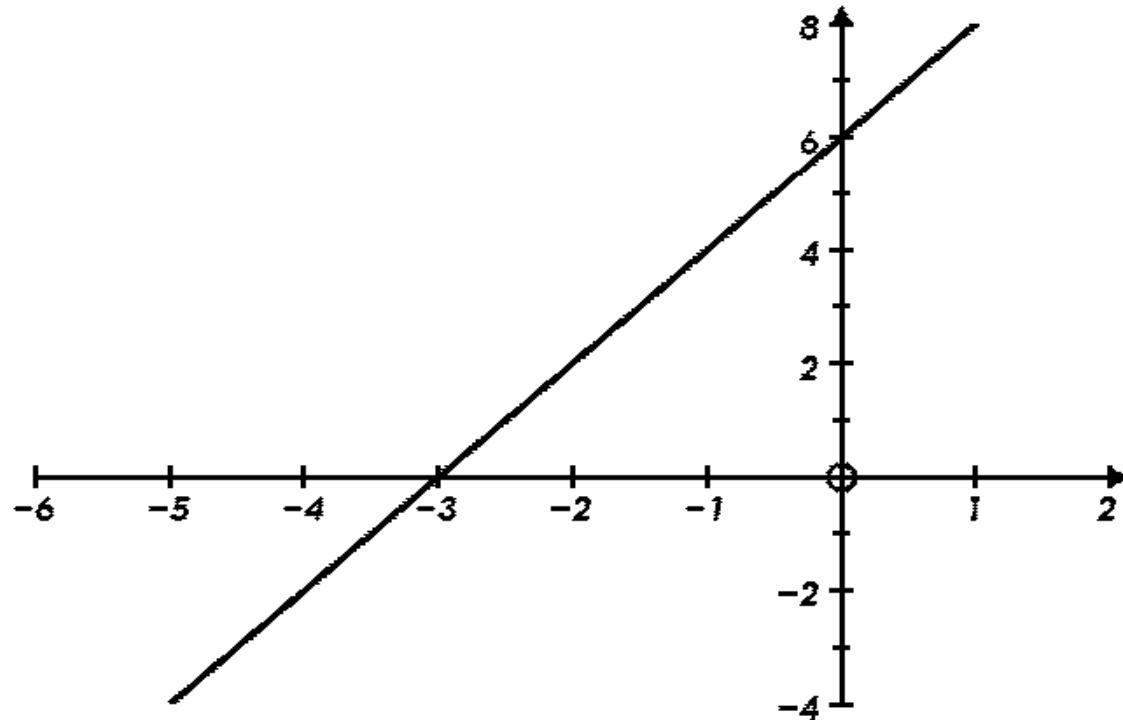
T5

n	Ans
1	
2	10
3	12
4	14

A2

G3

Cuir sé le *n*, ansin méadaigh faoi dó
w3

Méadaigh *n* faoi dó, ansin cuir dódhéag leis
w7
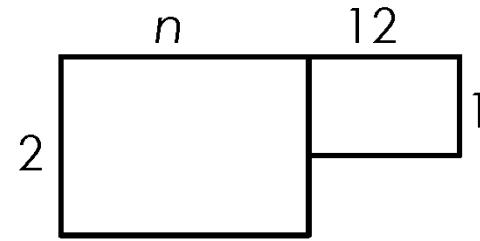
E3

$$2n + 12$$
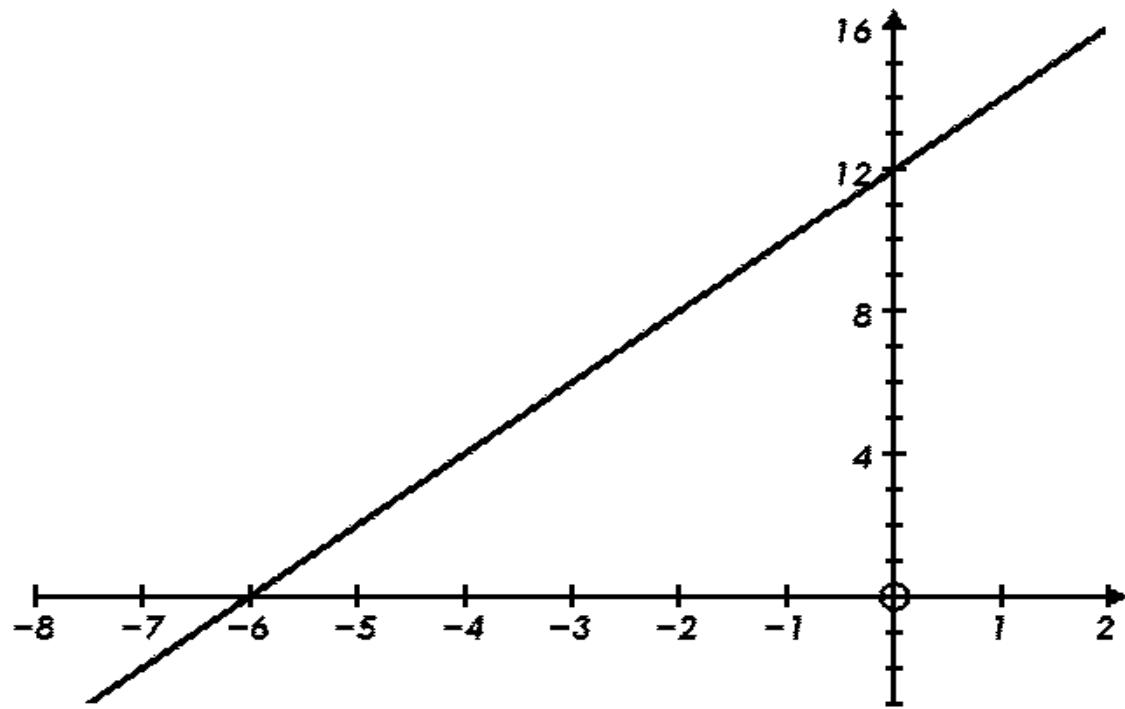
T1

n	Ans
1	14
2	16
3	18
4	20

A1

G4

**Cuir sé le *n*,
ansin cearnaigh
W6 an freagra**

T4

n	Ans
1	
2	
3	81
4	100

A6

E8

$$(n+6)^2$$

E9

$$n^2 + 12n + 36$$

G5

Tionscadal Mata
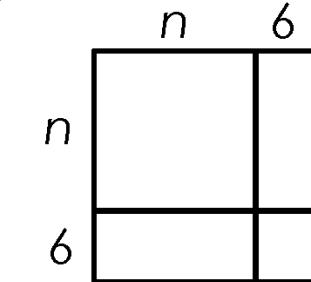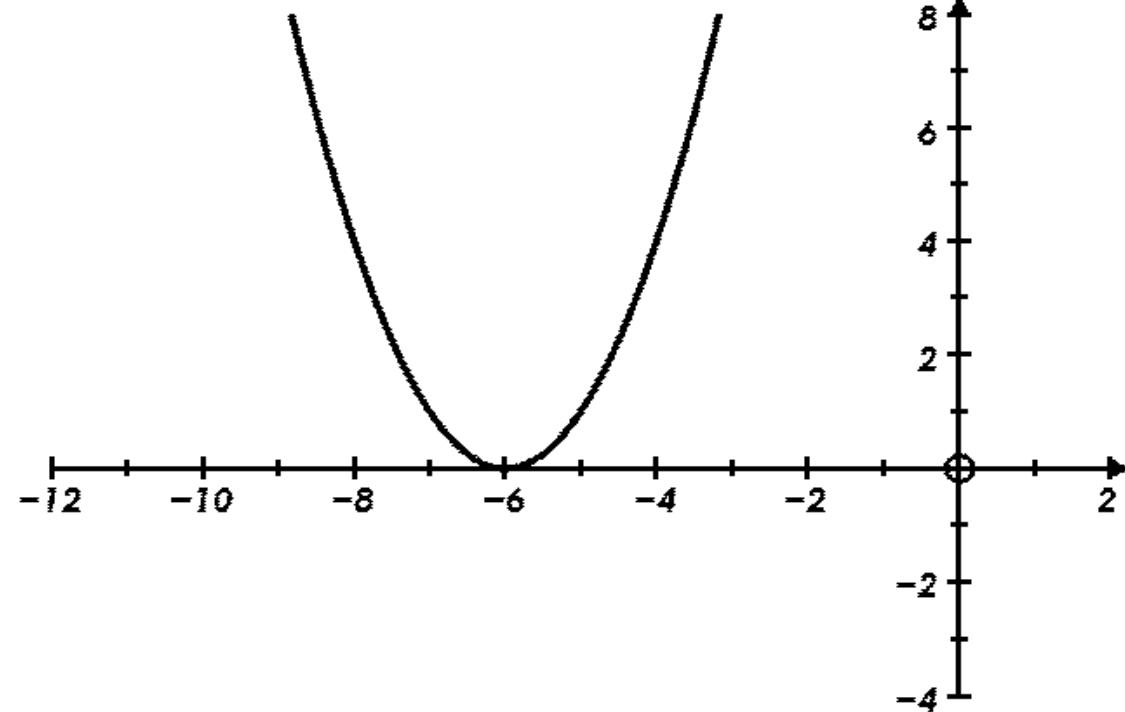
Roinn *n* ar dó, ansin cuir sé leis

w
8

n	Ans
1	6.5
2	7
3	7.5
4	8

n 6

$\frac{1}{2}$ 1

$$\frac{n}{2}+6$$

G6

Tionscadal Mata
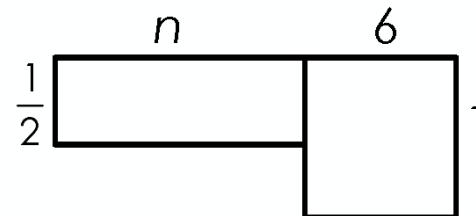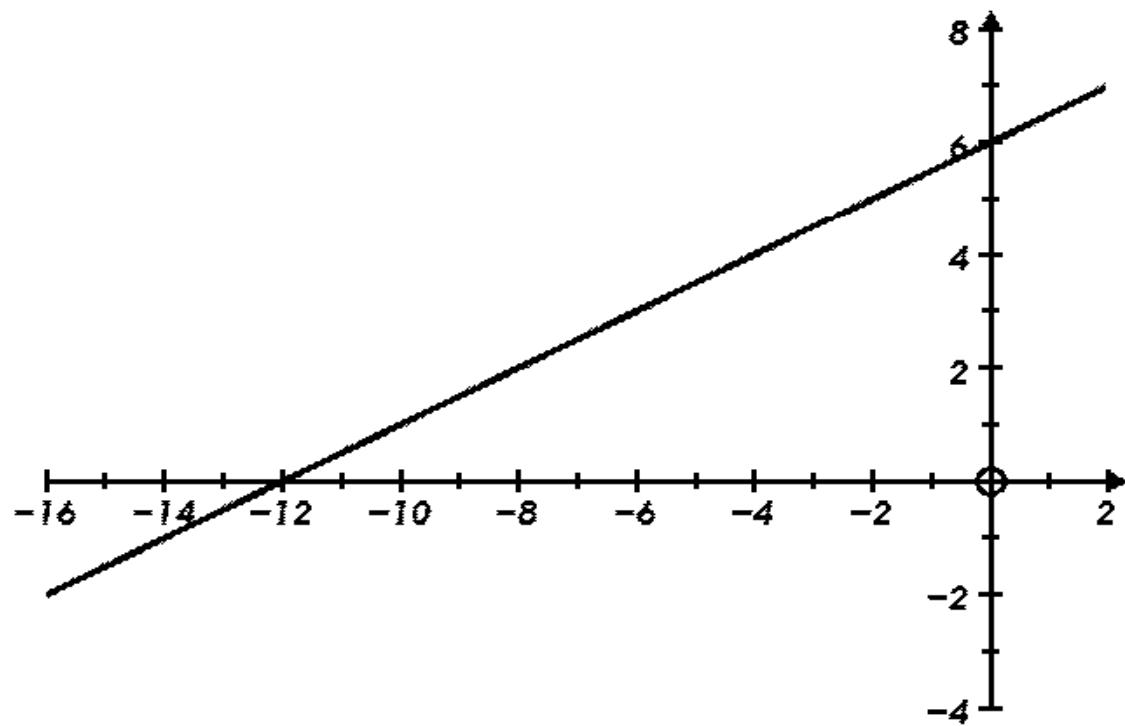
Cearnaigh *n*, ansin cuir sé leis an freagra

W9
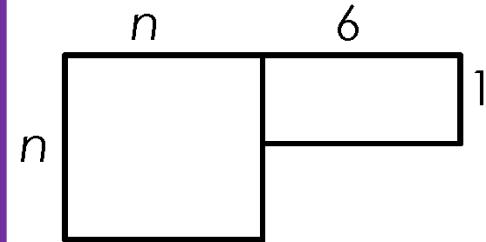
E2

$$n^2 + 6$$
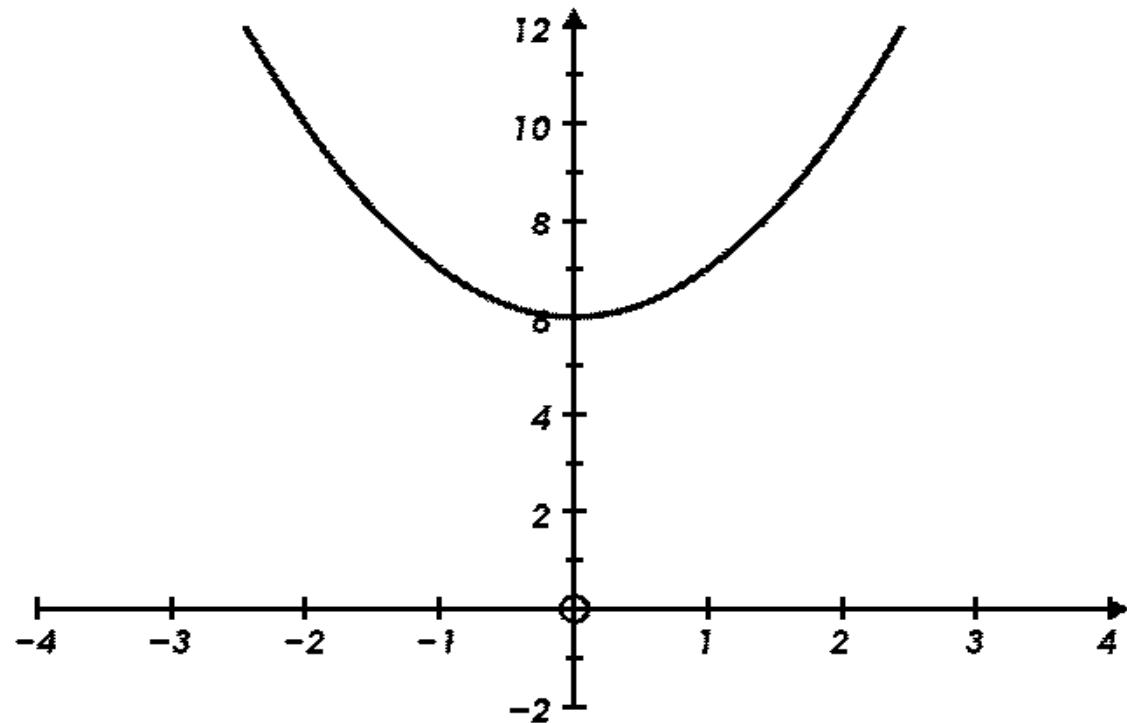
T3

n	Ans
1	
2	10
3	15
4	22

A7

G7

E3

$$2n+12$$

A1

Top labels: n, 12; left label 2; right label 1

E4

$$2n+6$$

E5

$$2(n+3)$$

A2
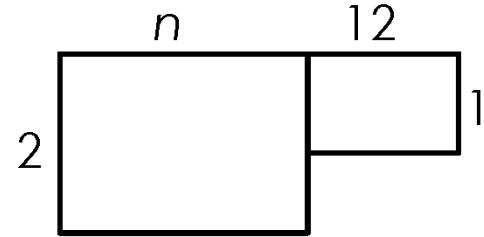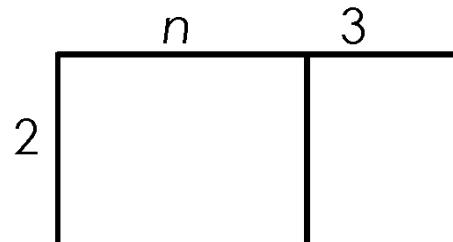
Top labels: n, 3; left label 2

E6

$$\frac{n}{2} + 6$$

E1

$$\frac{n+6}{2}$$

E10

$$\frac{n}{2} + 3$$

A5

A4

E7

$$(3n)^2$$

A3

E8

$$(n+6)^2$$

E9

$$n^2 + 12n + 36$$

A6

E2

$$n^2 + 6$$

A7