Distribution property (Number outside the bracket)

- When there is a number outside a bracket then that number is multiplied to each term inside the bracket and then we do the same steps as before to isolate the variable

$$4(x-3)=20$$
$$4(x)-4(3)=20$$
$$4x-12=20$$
$$4x-12+12=20+12$$
$$4x=32$$
$$\frac{4x}{4}=\frac{32}{4}$$
$$x=8$$

You Try

Ex) 4 (2k- 7) = -12

$8k-28=-12$

$8k-28+28=-12+28$

$8k=16$

$\frac{8k}{8}=\frac{16}{8}$

$k=2$

Ex) -3 (x+ 5) = +21

$-3x-15=21$

$-3x-15+15=21+15$

$-3x=36$

$\frac{-3x}{(-3)}=\frac{36}{(-3)}$

$x=-12$

Input/ Output Charts

Making charts using algebraic equations

Use the relationship $y = 3x + 4$ to complete the four missing values for y in the table of values below (Show work)

x	-4	0	1	6
y	-8	4	7	22

$x = -4$
$y = 3x + 4$
$y = 3(-4) + 4$
$y = -12 + 4$
$y = -8$

$x = 0$
$y = 3x + 4$
$y = 3(0) + 4$
$y = 0 + 4$
$y = 4$

$x = 1$
$y = 3x + 4$
$y = 3(1) + 4$
$y = 3 + 4$
$y = 7$

$x = 6$
$y = 3x + 4$
$y = 3(6) + 4$
$y = 18 + 4$
$y = 22$

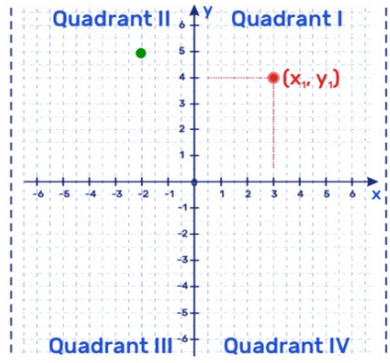
Input/ Output

Given an input value find the output

(In ,Out)

(x , y) is an ordered pair

Ex) (-2, 5)



Use the relationship $y = -3x + 7$ to find the missing value in the ordered pairs below. (Show work)

a) (-10, ___)

x, y

Given $x = -10$ $y = ?$

$y = -3x + 7$

$y = -3(-10) + 7$

$y = 30 + 7$

$y = 37$

$(-10, 37)$

b) (12, ___)

x, y

Given $x = 12$ $y = ?$

$y = -3x + 7$

$y = -3(12) + 7$

$y = -36 + 7$

$y = -29$

$(12, -29)$

c) (___, -8)

x, y

Given $y = -8$ $x = ?$

$y = -3x + 7$

$-8 = -3x + 7$

$-8 - 7 = -3x + 7 - 7$

$-15 = -3x$

$\frac{-15}{-3} = \frac{-3x}{-3}$

$5 = x$

$(5, -8)$

Writing Equation For a given chart

Steps:

1) Determine the change happening with the y values

* This number goes in front of the variable

(Gets multiplied by letter)

Down 2 for y

$-2x$

Sub in $x=-3$ $\Rightarrow y=7$

$-2x$

$-2(-3)$

6

not same

Add 1

2) Determine if you have to add or subtract some value

* Take a (x,y) value from the chart.

* Sub x into step one and find out what you need to add or subtract from the product it to get the correct y value

X	Y
-3	7
-2	5
-1	3
0	1
1	-1
2	-3

Down by 2

so far we have y = -2x

Pick any point in chart

(1,-1)

Sub in x= 1 to y=-2x

x= 1 y = -1

y = -2(1)

= -2

not same

But can add 1 to make them the same

y = -2x + 1

You try

x	y
−2	−18
−1	−11
0	−4
1	3
2	10

up 7

7x

Sub in x=-2 y=-18

7(x)

7(-2)

-14

Not same

Subtract 4

$y=7x-4$

x	y
−2	13
−1	11
0	9
1	7
2	5

Down 2

$-2x+9$

Sub x=0

-2(0)

0

y=9

add 9

Show work to find the equation for each table

Ws

1

x	y
0	6
1	7
2	8
3	9
4	10

Equation: _____

2

x	y
1	1
2	5
3	9
4	13
5	17

Equation: _____

3

x	y
4	12
5	16
6	20
7	24

Equation: _____

4

x	y
0	0
1	6
2	12
3	18

Equation: _____

5

x	y
-2	6
-1	10
0	14
1	18

Equation: _____

6

x	y
0	3
1	7
2	11
3	15

Equation: _____

Determine the equation for each chart below

Ws

x	y
−2	−22
−1	−12
0	−2
1	8
2	18

x	y
−2	−10
−1	−9
0	−8
1	−7
2	−6

x	y
−2	18
−1	13
0	8
1	3
2	−2

x	y
−2	−14
−1	−7
0	0
1	7
2	14

Make a chart for the following equations using x= -2 to x=+2

a) y= 2x +15

b) y= -x - 7

c) y= -3x + 4

Solve each equation. Ws

Worksheet

1) $-4 = \frac{b}{10}$

2) $x + 2 = 16$

3) $-17 = -3 + n$

4) $\frac{a}{4} = 12$

5) $p - 2 = -8$

6) $x + 5 = 24$

7) $-11 = \frac{a}{17}$

8) $24 = 16 + p$

9) $x - 20 = -22$

10) $12 = -3 + n$

WS

11) $-4+2n=-14$

12) $-21=k-7$

13) $210=-15n+30$

14) $-26=-2r+4$

15) $64=-16x-2$

16) $10=\frac{m}{5}+3$

17) $-5(2n+1)=15$

18) $3(x-8)=21$

19) $-2(8-6x)=44$

20) $4(3n-1)=-88$

Show work to find the equation for each table

Ws Solutions

1

x	y
0	6
1	7
2	8
3	9
4	10

up 1

1x

Sub x = 0 ⇒ y = 6

Equation: 1(0) + 6 = 6

y = x + 6

2

x	y
1	1
2	5
3	9
4	13
5	17

up 4

4x

x = 1

4(1) = 4

y = 1 subtract 3

Equation:

y = 4x − 3

3

x	y
4	12
5	16
6	20
7	24

up 4 → 4x

x = 4

4(4) = 16

y = 12 subtract 4

Equation:

y = 4x − 4

4

x	y
0	0
1	6
2	12
3	18

up 6

6x

x = 0

6(0) = 0

y = 0 same

Equation:

y = 6x

5

x	y
-2	6
-1	10
0	14
1	18

up 4 → 4x

x = -2

4(-2) = -8

y = 6 add 14

Equation:

y = 4x + 14

6

x	y
0	3
1	7
2	11
3	15

up 4 → 4x

sub x = 0

4(0) = 0

y = 3 add 3

Equation:

y = 4x + 3

Determine the equation for each chart below

Ws Solutions

x	y
−2	−22
−1	−12
0	−2
1	8
2	18

up 10 → 10x

Sub x=-2 → y=-22

10(-2) = -20

Need to subtract 2

y= 10x - 2

x	y
−2	−10
−1	−9
0	−8
1	−7
2	−6

up 1 → 1x

Sub x=-2 → y=-10

1(-2) = -2

Subtract 8

y= x - 8

x	y
−2	18
−1	13
0	8
1	3
2	−2

down 5 → -5x

Sub x=-2 → y=18

-5(x)

-5(-2)

+ 10

So need to add 8

y= -5x + 8

x	y
−2	−14
−1	−7
0	0
1	7
2	14

up → 7x

Sub in x=-2 → y=-14

7x

7(-2)

-14

Same

y = 7x

Make a chart for the following equations using x= -2 to x=+2

a) y= 2x +15

b) y= -x - 7

c) y= -3x + 4

Solve each equation. Ws Solutions Worksheet

1) $-4 = \frac{b}{10}$

$10 \cdot -4 = \frac{b}{10} \cdot 10$

$-40 = b$

2) $x + 2 = 16$

$x + 2 - 2 = 16 - 2$

$x = 14$

3) $-17 = -3 + n$

$-17 \overset{+3}{=} -3 \overset{+3}{+} n$

$-14 = n$

4) $\frac{a}{4} = 12$

$4 \times \frac{a}{4} = 12 \times 4$

$a = 48$

5) $p - 2 = -8$

$p - 2 \overset{+2}{=} -8 \overset{+2}{+}$

$p = -6$

6) $x + 5 = 24$

$x + 5 - 5 = 24 - 5$

$x = 19$

7) $-11 = \frac{a}{17}$

$17 \times (-11) = \frac{a}{17} \times 17$

$-187 = a$

8) $24 = 16 + p$

$24 \overset{-16}{=} 16 \overset{-16}{+} p$

$8 = p$

9) $x - 20 = -22$

$x - 20 \overset{+20}{=} -22 \overset{+20}{+}$

$x = -2$

10) $12 = -3 + n$

$12 \overset{+3}{=} -3 \overset{+3}{+} n$

$15 = n$

WS

Solutions

11) $-4+2n=-14$

$-4+4+2n=-14+4$

$2n=-10$

$\frac{2n}{2}=\frac{-10}{2}$

$n=-5$

12) $-21=k-7$

$-21+7=k-7+7$

$-14=k$

13) $210=-15n+30$

$210-30=-15n+30-30$

$180=-15n$

$\frac{180}{-15}=\frac{-15n}{-15}$

$n=-12$

14) $-26=-2r+4$

$-26-4=-2r+4-4$

$-30=-2r$

$\frac{-30}{-2}=\frac{-2r}{-2}$

$15=r$

15) $64=-16x-2$

$64+2=-16x-2+2$

$66=-16x$

$\frac{66}{-16}=\frac{-16x}{-16}$

$x=4.125$

16) $10=\frac{m}{5}+3$

$10-3=\frac{m}{5}+3-3$

$7=\frac{m}{5}$

$5\times 7=\frac{m}{5}\times 5$ $\Rightarrow$ $m=35$

17) $-5(2n+1)=15$

$-10n-5=15$

$-10n-5+5=15+5$

$-10n=20$

$\frac{-10n}{-10}=\frac{20}{-10}$ $\Rightarrow$ $n=-2$

18) $3(x-8)=21$

$3x-24=21$

$3x-24+24=21+24$

$3x=45$

$\frac{3x}{3}=\frac{45}{3}$

$x=15$

19) $-2(8-6x)=44$

$-16+12x=44$

$-16+16+12x=44+16$

$12x=60$

$\frac{12x}{12}=\frac{60}{12}$

$x=5$

20) $4(3n-1)=-88$

$12n-4=-88$

$12n-4+4=-88+4$

$12n=-84$

$\frac{12n}{12}=\frac{-84}{12}$

$n=-7$