

Percentage Increase & Decrease

Example

You find a portable CD player on sale. Its marked price is \$199 but the sale is offering 15% discount. How much do I pay?

Answer

$$0.15 \times 199 = 29.85$$
$$\text{sale price} = 199 - 29.85$$
$$\$169.15$$

Point

Money always rounded to 2nd D.P

Example

A sweatshirt has a cost price of \$124. The shop wants to make 15% profit what is the selling price?

Answer

$$0.15 \times 124 = \$18.60$$
$$\text{selling price} = 124 + 18.60$$

28/5 Finding Percentage change

This can be an increase or a decrease

$$\% \text{ change} = \frac{\text{amount of change}}{\text{original amount}} \times 100$$

Example

you buy a car for \$33,000 and 3 years later sell it for \$18,000 = 44%

31/5 Algebra

In algebra we let letters stand for numbers. The letters are called variables. We ~~have~~ leave out the thing

Examples

1) $x + 5 \rightarrow$ a number plus 5

2) $5x \rightarrow$ 5 times a number

3) $\frac{x}{10} \rightarrow$ a number divided by 10

4) $-2x \rightarrow$ a number times negative 2

Substitution

We let the variables take on particular values

Examples

$$a=5, b=10, c=2$$

$$1) a+b$$

$$abc$$

Subtraction with brackets

Do brackets first

Examples

$$x=5, y=2, r=1$$

$$1) x(x+y)$$

$$2) 3(r+x)$$

$$3) 2(x+y+r)$$

Answers

$$1) 5(2+5) = 5 \times 7 = 35$$

$$2) 3(-1+5) = 3 \times 4 = 12$$

$$3) 2(5+2+1) = 2 \times 8 = 16$$

Simplify by collecting like terms

like terms have the same variable or variables and powers of the variable

We can only add or subtract like terms

Examples

Simplify

$$1) k + 2k = 3k$$

$$2) 9x + x - 2x = 8x$$

$$3) 4y + 2 - y = 3y + 2$$

$$4) 2ab + 3ab = 5ab$$

$$5) x^2 + 9x^2 = 10x^2$$

$$6) 5x - x = 4x$$

$$7) 3y - 3y = 0$$

Number Patterns

Use the pattern to continue it.

Examples write the next 3 terms

1) 5, 7, 9, 11, 13, 15 (add 2)

2) 5, 3, 1, -1, -3, -5 (-2)

3) 1, 4, 9, 16, 25, 36 (squares)

4) 1, 2, 3, 5, 8, 13, 21 (add previous two terms)

Rules from number patterns

We need the start of zero term and how much to add (or subtract) each time.
~~Since~~ Since repeated addition is multiplication this gives us the multiplier

Examples

Find each rule

1)

N	T
0	2
1	6
2	10
3	14
4	18

$T = 4n + 2$

2)

N	T
0	4
1	-1
2	2
3	5
4	8

$T = 3n - 4$

2) for each rule, find T when $n = 20$

a) $T = 4 \times 20 + 2$
 $T = 82$

b) $T = 3 \times 20 - 4$
 $T = 56$