

# EXPRESSIONS AND FORMULAE



# INCLUDES:

Can you  
solve  
these?



- PPSX
- WORKSHEETS
- HOMEWORK
- PUZZLES
- ANSWER KEYS

# 23 PPSX SLIDES

## EXPRESSIONS AND FORMULAE

Evaluate  $\frac{e^3 + 2fg}{g^2 - 7}$

If  $e = 4$ ,  $f = -2$  and  $g = 3$

$$\frac{e^3 + 2fg}{g^2 - 7} = \frac{4^3 + 2(-2 \times 3)}{3^2 - 7}$$

Replace variables with the given values

$$= \frac{64 + 2(-6)}{9 - 7}$$

Evaluate the numerator and denominator separately.

$$= \frac{64 - 12}{9 - 7}$$

Multiply 2 and -6

$$= \frac{52}{2} \text{ or } 26$$

Simplify the numerator and denominator. Then divide.

### When do we use formulae?

Most medicine is prescribed in accordance with our weight

To calculate taxes, pensions and loans

A lot of formulae are used in construction. If a formula is wrong the building can collapse.

Evaluate  $a + (b - 2)^2$

If  $a = 2$  and  $b = -3$

$$a + (b - 2)^2 = 2 + (-3 - 2)^2$$

Replace a with 2 and b with -3.

$$= 2 + (-5)^2$$

Add -3 and -2.

$$= 2 + 25$$

Find  $(-5)^2$ .

$$= 27$$

Add 2 and 25.

Can you solve these?

$b$  branches into  $\times b$ ,  $-4b$ , and  $+2b$ , each leading to a blank box.

### Formula

is a mathematical sentence that expresses the relationship between certain quantities.

$$s = \frac{d}{t}$$

$$d = s \times t$$

$$t = \frac{d}{s}$$

If you know the value of every variable in the formula except one, you can find the value of the remaining variable.

If  $y = 7$ , work out the value of the expressions

$6y$  →

$-3y + 11$  →

$5y^2$  →

$3(y - y^2)$  →

Formula  $P = G - GT$  shows how much a person earns a year.

Where  $P$  is net pay,  $G$  is gross salary and  $T$  is taxes.

Find how much money the person earns if  $G = \$60000$  and  $T = 30\%$

Use a formula

$P = G - GT$      $P = 60000 - 60000 \times 30\%$     Replace G with 60000 and T with 30%.

$P = 60000 - 60000 \times 0.3$     Replace % with the decimal

$P = 60000 - 18000$     Multiply 60000 and 0.3

$P = \$42000$     Subtract 18000 from 60000

### As great as Houdini!

- Ask a friend to roll 2 dice. (5 and 3)
- Multiply the number on the first dice by 5 ( $5 \times 5 = 25$ )
- Add 3 ( $25 + 3 = 28$ )
- Double the answer ( $28 \times 2 = 56$ )
- Add the number from the second dice ( $56 + 3 = 59$ )
- Add 5 ( $59 + 5 = 64$ )
- Subtract 11 from the answer. ( $64 - 11 = 53$ )
- And you will have the numbers on the dice 5 and 3

Paying \$9 per Mbps for the internet in 2008 was like paying how much money in 2021?

To compare dollar amounts use the formula  $V = \frac{O}{C} I$ .

$V$  is the current value    Use a formula     $O$  is the old dollar amount     $I$  is the converting's year CPI

In 2008 CPI was 215.3 and in 2021 reached 353.56

Use a formula

$$V = \frac{O}{C} I$$

Replace  $O = 9$ ,  $C = 215.3$  and  $I = 353.56$

$$V = \frac{9 \times 353.56}{215.3}$$

Perform multiplication followed by division

$$V = \$14.77$$

# EXTRA SLIDES

## Order of operations:

**B**rackets  
**I**ndices  
**D**ivision  
**M**ultiplication  
**A**ddition  
**S**ubtraction

We always move  
from **LEFT** to **RIGHT**



## Order of operations:

**P**ar Order of operations:  
**E**xponents  
**D**ivision  
**M**ultiplication  
**A**ddition  
**S**ubtraction

We always move  
from **LEFT** to **RIGHT**



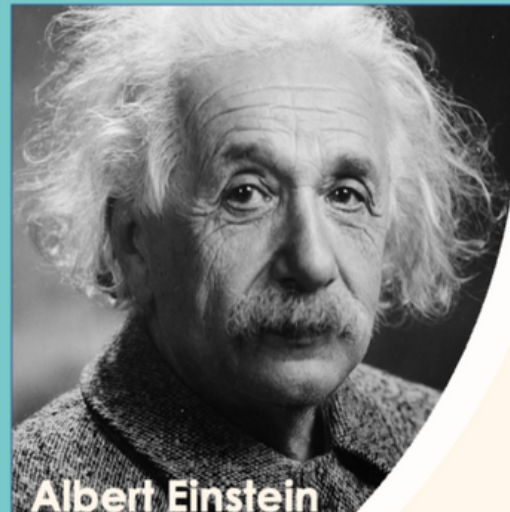
## Famous Formula

$$E = mc^2$$

It says that energy is equal to the mass of an object in its rest frame multiplied by the speed of light squared.

Any time energy is released, the process can be evaluated with this formula.

Eg. Driving a car, shooting an arrow.



Albert Einstein


# PRINTED MATERIALS:

CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**Do you know these?**  
Find the words then use them to label each of the examples below.

|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | R | T | M | H | Z | Q | G | D | N | X | L |
| O | Y | G | W | A | R | R | V | E | F | H | V |
| R | L | R | D | Q | B | X | M | X | B | C | A |
| M | P | O | W | E | R | Q | J | P | G | R | R |
| U | W | Q | S | X | E | U | C | R | G | F | I |
| L | P | H | Q | H | B | I | P | E | B | D | A |
| A | Y | X | R | S | S | E | W | S | X | L | B |
| L | K | P | S | B | Q | V | W | I | S | M | E |
| B | S | F | I | L | B | O | Y | S | B | U | L |
| L | K | P | S | B | Q | V | W | I | S | M | E |
| V | J | H | C | N | G | H | W | N | I | E | K |
| C | O | E | F | F | I | C | I | E | N | T | N |

7 \_\_\_\_\_  
b \_\_\_\_\_  
7b \_\_\_\_\_  
3c<sup>2</sup> \_\_\_\_\_  
7b + 3c<sup>2</sup> \_\_\_\_\_  
T = 7b + 3c<sup>2</sup> \_\_\_\_\_

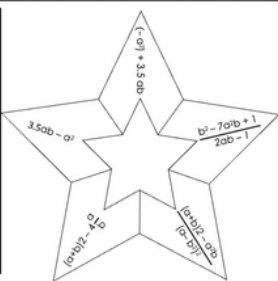


CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_


**Expressions: Silver**

Evaluate the expressions and write the answers at the ends of the smaller star.

If a = 3  
If b = 2



Expressions on star pieces:  
 $(-a) + 3.5ab$   
 $3.5ab - a^2$   
 $b^2 - 7ab + 1$   
 $2ab - 1$   
 $(a+b)^2 - 4a$   
 $(a+b)^2 - 4b$   
 $(a+b)^2 - 4a$   
 $3.5ab - a^2$   
 $(a+b)^2 - 4a$   
 $(a+b)^2 - 4b$



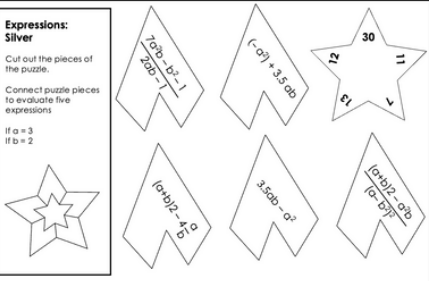
CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**Expressions: Silver**

Cut out the pieces of the puzzle.

Connect puzzle pieces to evaluate five expressions

If a = 3  
If b = 2



Expressions on puzzle pieces:  
 $(a+b)^2 - 1$   
 $(-a) + 3.5ab$   
 $30$   
 $12$   
 $11$   
 $12$   
 $7$   
 $(a+b)^2 - 4a$   
 $3.5ab - a^2$   
 $(a+b)^2 - 4a$   
 $(a+b)^2 - 4b$

CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**EXPRESSIONS AND FORMULAE**

Evaluate and colour the correct answer

1.  $20 + (5 - 3) + 5^2(-3)$     97    -53    44    53

2.  $12 - [16 - 2(6^2 + 3 \times \frac{1}{2})]$     8    8.4    -20    -16

CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**EXPRESSIONS: CUT AND PASTE**

Read the problems below and find the answers on the next page. Cut out the box with the correct answer and glue it into the box with the problem.

|                                     |  |                                 |
|-------------------------------------|--|---------------------------------|
| Subtract 11 from the sum of y and 6 | The product of 7 and the sum of a number y and 3 | Five less than twice a number y |
|-------------------------------------|--|---------------------------------|

CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**FORMULAE: WORD PROBLEMS**

Use your knowledge to write formulae and then solve the problems

1. Halsbury High School students had a fundraiser. They sold cupcakes. Each treat weighed 90g and was sold for \$5. What was the cost for macaroons per kilogram?

Show your working:

CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**EVALUATING EXPRESSIONS**

Show your working.


1. If b = 5, what is the value of  $\frac{3b}{2b-2}$  ?

2. What is the value of  $3c^2 + 3c - 7$ , when c = -2 ?

3.  $A = 5c^3$ , what is the value of A when c = 5 ?

4. What is the value of  $(c^2 + d)^2 - (3cd)$ , when c = -2 and d = -4 ?

5. What is the value of  $7\frac{m^2n}{m} - (m+n)$ , when m = -2 and n = -4 ?




CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**EXPRESSIONS: CUT AND PASTE**

Cut out the box with the correct answer and glue it into the box with the problem. You may not need to use all the answers.

I'M NOT WORDY. I AM A UNICORN

|             |           |               |
|-------------|-----------|---------------|
| $2y - 5$    | $y - 11$  | $10y$         |
| $y/5 - 3$   | $7t - 11$ | $y/5 - 3$     |
| $y/5 - 6$   | $7(y+3)$  | $6y$          |
| $7y \div 2$ | $3y$      | $y+6 - 11$    |
| $y/3 + 5$   | $y/3 + 8$ | $6(11 - y)$   |
| $y/3 - 6$   | $y/3$     | $7 \div (3y)$ |



CLASS \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

**FORMULAE: WORD PROBLEMS**

Use your knowledge to write formulae and then solve the problems

3. Jackson went to a music festival. He spent \$315 doubling his spending every following day. How much did he pay on the first day?



Show your working:

Formula: \_\_\_\_\_ Answer: \_\_\_\_\_

4. Tony is 18 years old. He is 6 less than 5 times Gina's age. How old is Gina?

Show your working:

Formula: \_\_\_\_\_ Answer: \_\_\_\_\_

- 1 WORDSEARCH
- PUZZLES ( 2 LEVELS OF DIFFICULTY)
- 4 WORKSHEETS
- CUT AND PASTE ACTIVITY
- ANSWER KEYS