Adding and subtracting integers

Adding a **negative** number **or** subtracting a **positive** number will have the **same result**.

$3 + -5 = -2$

$3 - +5 = -2$

Go down by 5.

Use a number line to visualise the answer.

Adding a positive number **or** subtracting a negative number will have the **same result**.

$-1 + +4 = +3$

$-1 - -4 = +3$

Go up by 4.

Adding a negative number means subtract.

Subtracting a negative number means add.

+ +	means	+
+ −	means	−
− +	means	−
− −	means	+

Multiplying and dividing integers

Look at these examples.

Multiplying a negative number by a positive number always gives a negative answer.

$-5 \times +3 = -15$

$+5 \times -3 = -15$

Multiplying two positive numbers **or** multiplying two negative numbers always gives a positive answer.

$+4 \times +3 = +12$

$-4 \times -3 = +12$

The same rules work for division.

$+10 \div -5 = -2$

$-10 \div -5 = +2$

This table summarises the rules:

+	× or ÷	+	=	+
+	× or ÷	−	=	−
−	× or ÷	+	=	−
−	× or ÷	−	=	+

A positive number multiplied by a negative number gives a negative answer.

A negative number multiplied by a negative number gives a positive answer.

KEYWORDS

Integer ➤ An integer is a whole number; it can be positive, negative or zero.

Positive ➤ A number above zero.

Negative ➤ A number below zero.

Use of symbols

Look at the following symbols and their meanings.

Symbol	Meaning	Examples
$>$	Greater than	$5 > 3$ (5 is greater than 3)
$<$	Less than	$-4 < -1$ (–4 is less than –1)
$\geqslant$	Greater than or equal to	$x \geqslant 2$ (x can be 2 or higher)
$\leqslant$	Less than or equal to	$x \leqslant -3$ (x can be –3 or lower)
$=$	Equal to	$2 + +3 = 2 - -3$
$\neq$	Not equal to	$4^2 \neq 4 \times 2$ (16 is not equal to 8)

Place value

Look at this example.

Given that $23 \times 47 = 1081$, work out 2.3×4.7

The answer to 2.3×4.7 must have the digits 1 0 8 1 ← Do a quick estimate to find where the decimal point goes.

2.3 is about 2 and 4.7 is about 5. Since $2 \times 5 = 10$, the answer must be about 10.

Therefore $2.3 \times 4.7 = 10.81$

Write the following symbols and numbers on separate pieces of paper.

+	–	×	÷	=	0

+2	–2	+4	–4	+8	–8

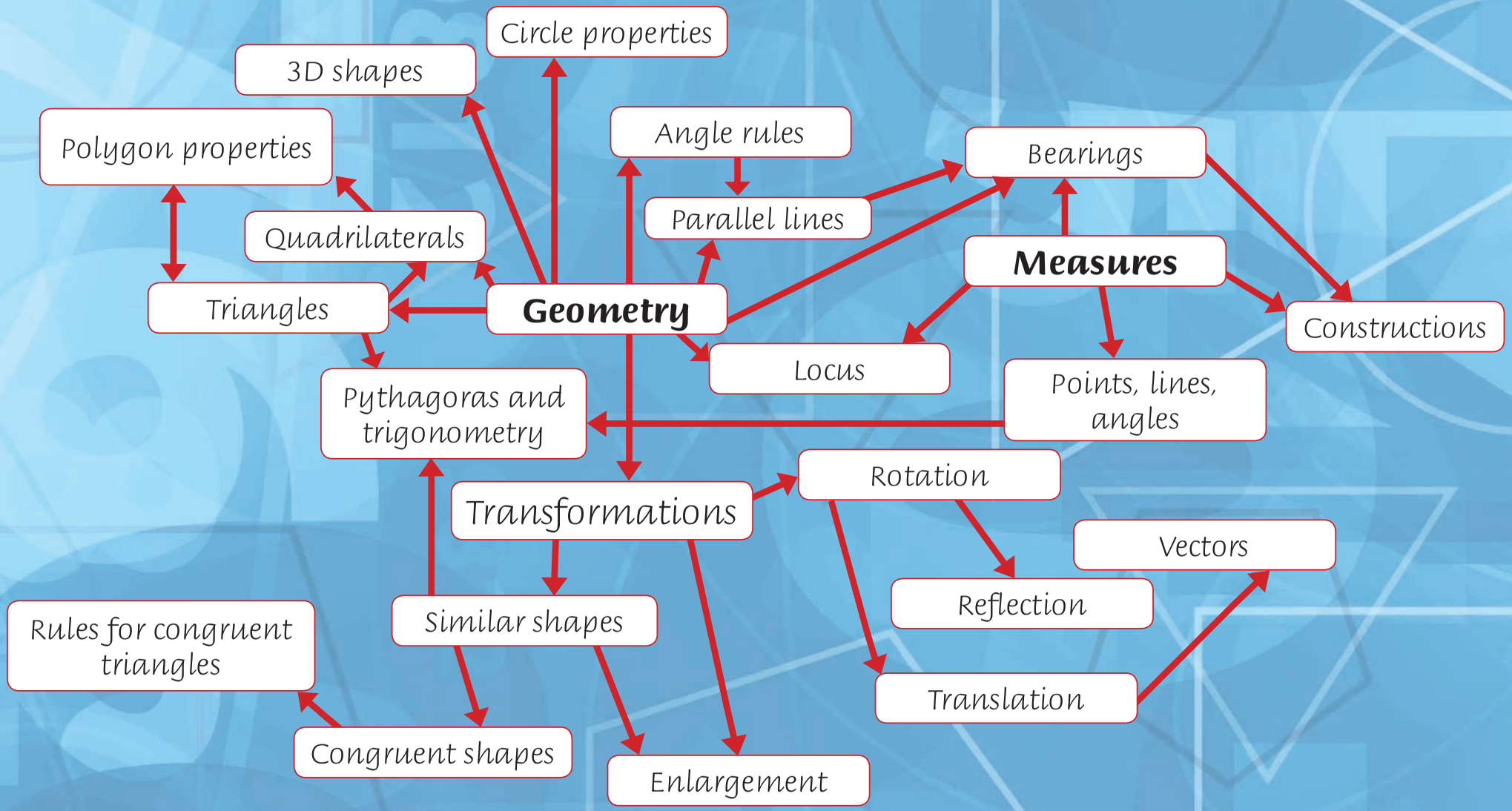
Arrange them to form a correct calculation.

How many different calculations can you make? For example:

+2	–	–2	=	+4

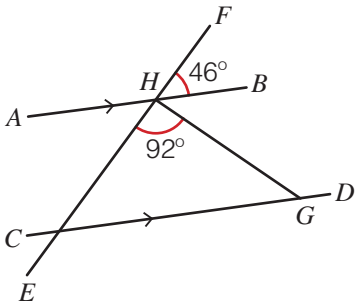
1. Calculate the following:
   - **(a)** $-5 - -8$
   - **(b)** $-2 + -6$
   - **(c)** $-7 + -3 - -5$
2. Calculate the following:
   - **(a)** -12×-4
   - **(b)** $24 \div -3$
   - **(c)** $-3 \times -4 \times -5$
3. State whether these statements are true or false.
   - **(a)** $6 < 3$
   - **(b)** $-4 > -5$
   - **(c)** $2 + -3 = 2 - +3$
4. Given that $43 \times 57 = 2451$, calculate the following:
   - **(a)** 4.3×0.57
   - **(b)** 430×570
   - **(c)** $2451 \div 5.7$

Geometry and Measures Mind Map



1. If the interior angle of a regular polygon is 156°, how many sides does it have? **[2]**

2. Find the angle HGD giving all your reasons. **[3]**

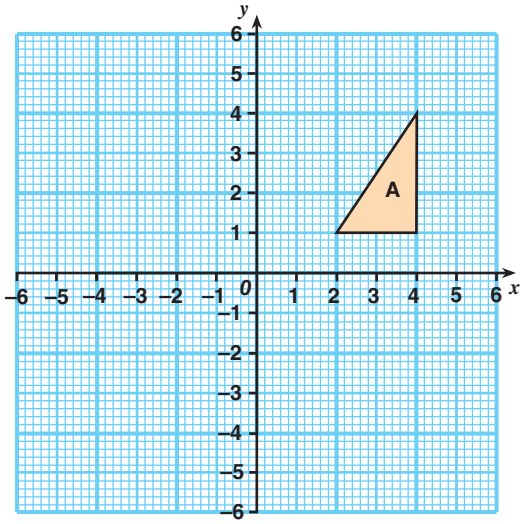


3. In triangle ABC the length AB = 10cm, angle BAC = 92° and angle ABC = 20°.
In triangle RST the length SR = 10cm, angle RST = 20° and angle STR = 68°.

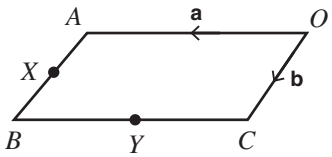
Draw triangles ABC and RST and show that they are congruent, giving your reasons. **[3]**

4. **(a)** Rotate shape A 90° clockwise about the point (0, 0) and label the image B. **[2]**

(b) Reflect B in the line $x = 0$ and label the image C. **[1]**



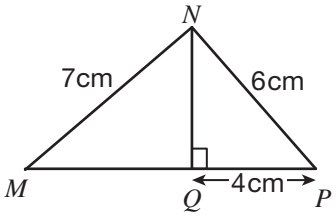
5. $OABC$ is a parallelogram with X the midpoint of AB and Y the midpoint of BC.



Use the vectors **a** and **b** to write:

(a) $\overrightarrow{OA}$ **[1]** **(b)** $\overrightarrow{OB}$ **[1]** **(c)** $\overrightarrow{OY}$ **[2]**

6.



(a) Find the length NQ. Give your answer to 2 decimal places. **[3]**

(b) Find the angle NMQ. Give your answer correct to 3 significant figures. **[3]**

7. Find the volume of this cylinder. Give your answer in terms of π. **[3]**