The New English School

Mathematics Department

Practice Makes Perfect (1)

Unit (1): Integers

Learner's book P. 9 - 29

Name:	Form: Year 7 (N, E, S, Star)

Adding and subtracting integers

Rules for Adding Integers

Signs of Integers	Operation to Use	Answer Sign	Quick Example
⊕ + ⊕	Add	Positive (+)	4+3=7
⊖ + ⊖	Add	Negative (-)	(-5)+(-3)=-8
⊕ + ⊖	Subtract	Use the **SIGN** of the integer with **BIGGER** absolute value	6+(-2)=4
⊖ + ⊕	Subtract		(-9)+(4)=-5

Subtracting Integers

Keep
- Keep the 1st number

Change
- Subtraction sign to Addition

Opposite
- Write down the opposite of the 2nd number

Then add the way you normally do.

Example:

$$-9 - 14 =$$

Keep Change Opposite

$$-9 + -14 = -23$$

Now follow the adding integers rules.

Question 1: Find the sums of the integers

a. $3 + -5 =$ -2

b. $-10 + 14 =$ 4

c. $-3 + -3 =$ -6

d. $15 + -7 =$ 8

Question 2: Subtract to find the difference.

a. $9 - -5 =$ 14

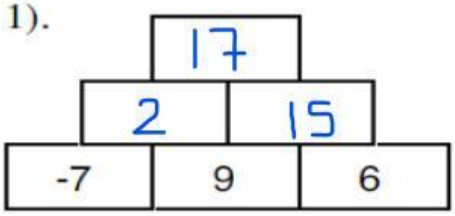
b. $-6 - 4 =$ -10

c. $13 - -6 =$ 19

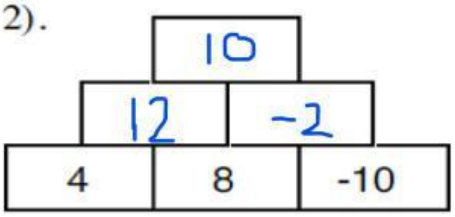
d. $-6 - -4 =$ -2

Question 3: To find the next number, **add** the two brick below it.

1).



2).



Question 4: Complete this addition table

+	-5	7	-3
2	-3	9	-1
-6	-11	1	-9

Question 5: Work out:

a) $-5 + 7 + -9 =$ -7

b) $-8 + -6 + 3 =$ -11

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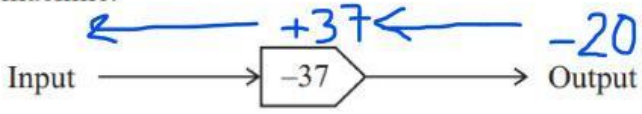
Q1 Calculate.

$-123 - (-72)$

-51

Q2 Here is a function machine.



(a) Find the output when the input is 21

$21 - 37$

-16

(b) Find the input when the output is −20

$-20 + 37$

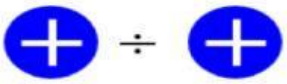
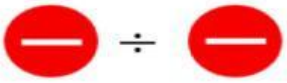
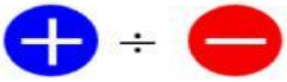
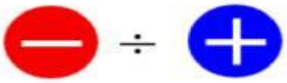
17

Multiplying and dividing integers

Rules for Multiplying Integers

Signs of Integers	Operation to Use	Answer Sign	Quick Example
	Multiply	Positive (+)	$5 \times 7 = 35$
	Multiply	Positive (+)	$(-6) \times (-4) = 24$
	Multiply	Negative (-)	$3 \times (-5) = -15$
	Multiply	Negative (-)	$(-4) \times (9) = -36$

Rules for Dividing Integers

Signs of Integers	Operation to Use	Answer Sign	Quick Example
	Divide	Positive (+)	$24 \div 6 = 4$
	Divide	Positive (+)	$(-15) \div (-3) = 5$
	Divide	Negative (-)	$42 \div (-7) = -6$
	Divide	Negative (-)	$(-10) \div (5) = -2$

Question 1: Work out:

1. -3 × 5 = −15 2. 4 × -2 = −8 3. 7 × 6 = 42

4. 10 × 8 = 80 5. -2 × 8 = −16 6. -10 × -5= 50

Question 2: Work out:

1. -9 ÷ 3 = −3 2. 16 ÷ -4 = −4

3. -3 ÷ -3 = 1 4. 14 ÷ -2 = −7

Question 3: Work out the missing numbers:

1) −4 × -8 = 32 2) 6 × 9 = 54

3) −5 × -10 = 50 4) -10 × 8 = -80

Question 4: Complete this multiplication table.

×	-5	7	-3
2	-10	14	-6
-6	30	-42	18

Question 5: Work out these calculations. Do the calculation in the brackets first.

a) 4 x (-5 + 2) = -12

-3

b) -7 x (-8 + 3) = 35

-5

c) -3 x (2 - -6) = -24

8

Tests for divisibility

Divisibility Rules	
A number is divisible by	
2	If last digit is 0, 2, 4, 6, or 8
3	If the sum of the digits is divisible by 3
4	If the last two digits is divisible by 4
5	If the last digit is 0 or 5
6	If the number is divisible by 2 and 3
8	If last 3 digits is divisible by 8
9	If the sum of the digits is divisible by 9
10	If the last digit is 0

Question 1: a) Show that the number 37 251 is divisible by 3 and 9.

_____

b) Change the final digit of 37 251 to make a number that is divisible by 3 but not by 9.

_____

Question 2: The number **2*20** is divisible by 9. Find the possible value of the digit *.

_____

Question 3: Fill in the table below using ✔ or ✘ after applying the divisibility test for each number.

Number	Divisible by							
	2	3	4	5	6	8	9	10
16341								
45632								

Question 4: Rearrange the digits 32571 to make a number

a) Divisible by 2 _____

b) Divisible by 4 _____

Question 5: Complete the table.

Number	Divisible by …
45261	
1768	
4500	

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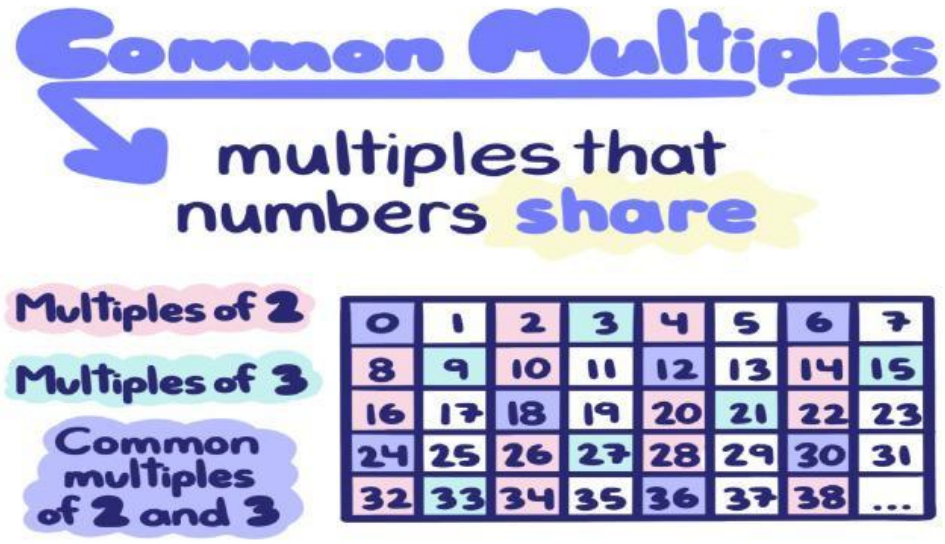
Q1

Eva says,

'I know that 14 107 is not divisible by 3
I do not need to do the calculation 14 107 ÷ 3 to show this.'

Write down how Eva shows that 14 107 is **not** divisible by 3

Lowest common multiples



Question 1: List the first four multiples of 12.

Question 2: Find the multiples of 6 that are less than 54.

Question 3: Find the common multiples of 6 and 8 that are less than 60.

Question 4: Write down 3 common multiples between 3 and 7.

Question 5: Find the LCM.

a. 4 and 12

LCM = _____

b. 5 and 7

LCM = _____

c. 4, 5, and 6

LCM = _____

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Q1 Draw a ring around **each** number that is a common multiple of 3 **and** 4

120 342 998 384

Q2 Draw a ring around **each** number that is a multiple of 3

237 343 905 558

Q3 Find the lowest common multiple (LCM) of 25 and 40

.....

Highest common factor

HCF of 18 and 27

Factors of 18 are:

1 2 3 6 9 18

Factors of 27 are:

1 3 9 27

HCF

Common Factors : 1, 3 and 9

Question 1: Find all the factors for each number. List them from least to greatest

a. 15 - ____, ____, ____, ____

b. 25 - ____, ____, ____

c. 18 - ____, ____, ____, ____, ____, ____

d. 27 - ____, ____, ____, ____

Question 2:

1. **Find the HCF of 8 and 12.**

   List the factors of 8. _____ List the factors of 12. _____

   List the common factors. _____ What is the HCF? _____

2. **Find the HCF of 15 and 20.**

   List the factors of 15. _____ List the factors of 20. _____

   List the common factors. _____ What is the HCF? _____

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Q1 Draw a ring around **each** number that is a common factor of 30 and 75

5 15 25 75

Q2 Find the highest common factor of 36 **and** 63

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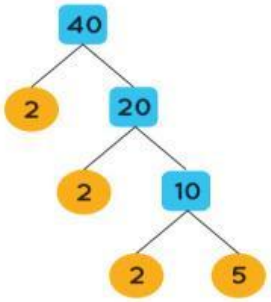
Prime factorization

Prime factorization is a way of expressing a number as a product of its **prime factors**.

Prime Factorization of 40

2	40
2	20
2	10
5	5
	1

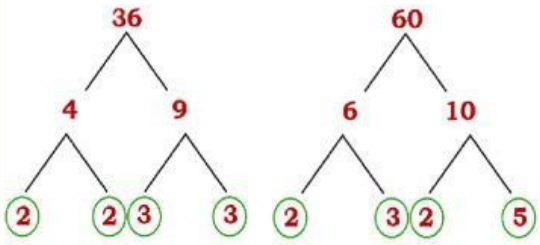
or



Prime factorization of 40 = $2 \times 2 \times 2 \times 5$

= $2^3 \times 5$

Example 1: Find the HCF of 36 and 60



36 = 2 x 2 x 3 x 3 60 = 2 x 2 x 3 x 5

We identify all the common factors that are **2, 2, 3**.

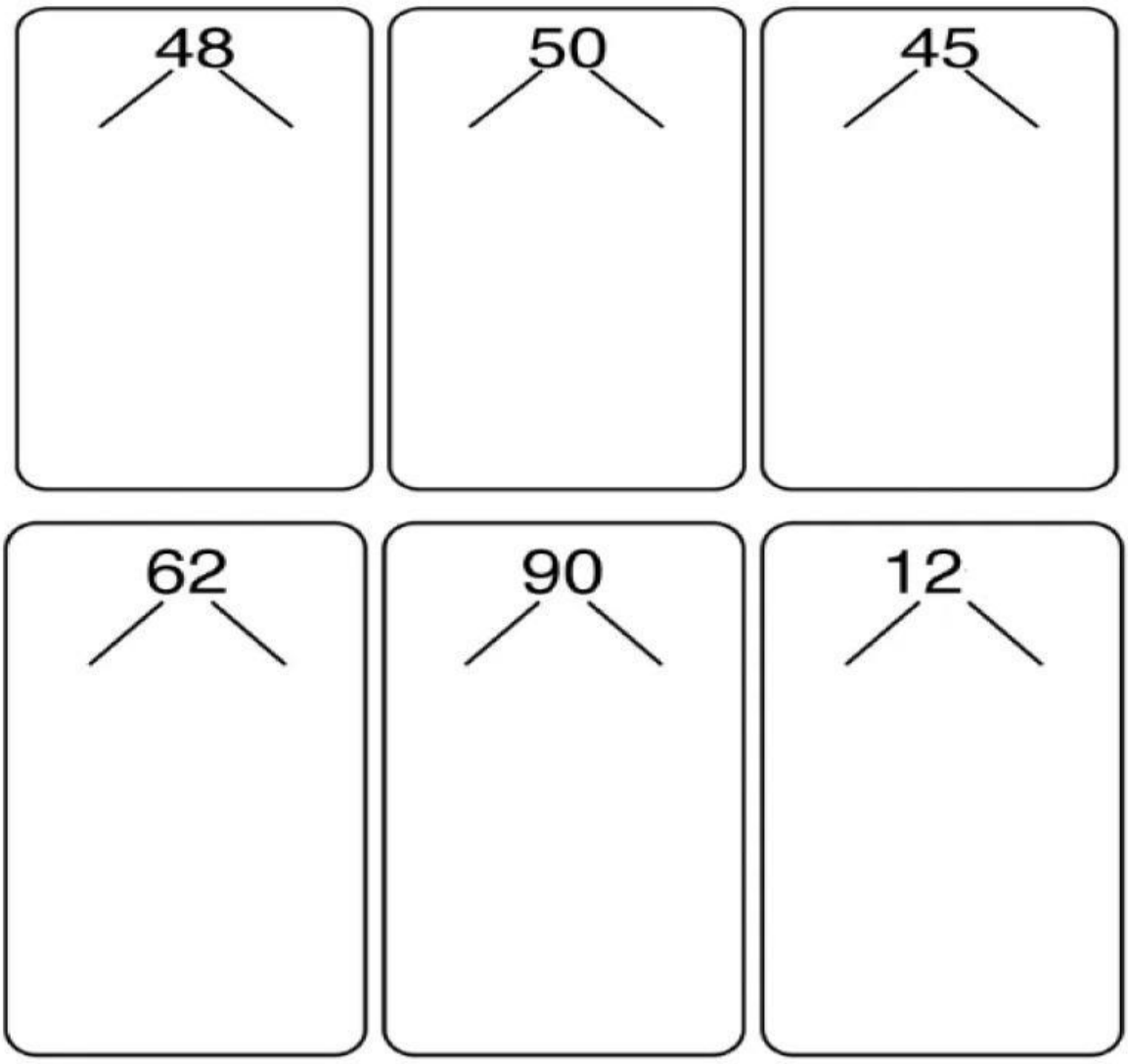
36 = **2** x **2** x **3** x 3.

60 = **2** x **2** x **3** x 5

We multiply the factors and the product is the HCF of 36 and 60.

HCF (36,60) = 2 x 2 x 3 = 12

Question 1: Use the number trees to find the prime factors of each number.



Question 2: Find the HCF of 24 and 60 using the prime factorization.

Square roots and cube roots

Perfect Squares and Square Roots

Perfect Squares	Square Roots	Squares
1	$\sqrt{1}=1$	$1^2 = 1$
4	$\sqrt{4}=2$	$2^2 = 4$
9	$\sqrt{9}=3$	$3^2 = 9$
16	$\sqrt{16}=4$	$4^2 = 16$
25	$\sqrt{25}=5$	$5^2 = 25$
36	$\sqrt{36}=6$	$6^2 = 36$
49	$\sqrt{49}=7$	$7^2 = 49$
64	$\sqrt{64}=8$	$8^2 = 64$
81	$\sqrt{81}=9$	$9^2 = 81$
100	$\sqrt{100}=10$	$10^2 = 100$
121	$\sqrt{121}=11$	$11^2 = 121$
144	$\sqrt{144}=12$	$12^2 = 144$
169	$\sqrt{169}=13$	$13^2 = 169$
196	$\sqrt{196}=14$	$14^2 = 196$
225	$\sqrt{225}=15$	$15^2 = 225$