



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
$\oplus + \oplus$	Add	Positive (+)	$4+3=7$
$\ominus + \ominus$	Add	Negative (-)	$(-5)+(-3)=-8$
$\oplus + \ominus$	Subtract	Use the SIGN of the integer with BIGGER absolute value	$6+(-2)=4$
$\ominus + \oplus$	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:

$$-9 - 14 =$$

$$\overset{\text{Keep}}{-9} \overset{\text{Change}}{+} \overset{\text{Opposite}}{-14} = -23$$

Now follow the adding integers rules.

Question 1: Find the sums of the integers

a. $3 + -5 = \underline{-2}$

c. $-3 + -3 = \underline{-6}$

b. $-10 + 14 = \underline{4}$

d. $15 + -7 = \underline{8}$

Question 2: Subtract to find the difference.

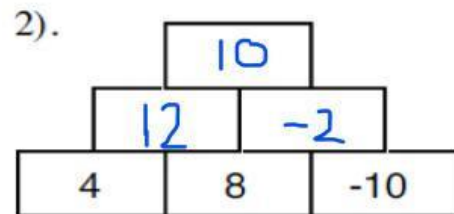
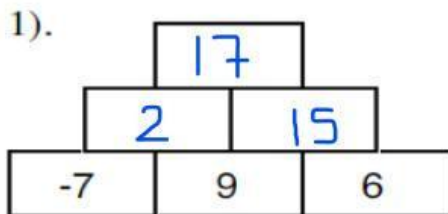
a. $9 - -5 = \underline{14}$

c. $13 - -6 = \underline{19}$

b. $-6 - 4 = \underline{-10}$

d. $-6 - -4 = \underline{-2}$

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



Question 4: Complete this addition table

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

Question 5: Work out:

a) $-5 + 7 + -9 = \underline{-7}$

b) $-8 + -6 + 3 = \underline{-11}$

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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. $-3 \times 5 = \underline{-15}$ 2. $4 \times -2 = \underline{-8}$ 3. $7 \times 6 = \underline{42}$

4. $10 \times 8 = \underline{80}$ 5. $-2 \times 8 = \underline{-16}$ 6. $-10 \times -5 = \underline{50}$

Question 2: Work out:

1. $-9 \div 3 = \underline{-3}$ 2. $16 \div -4 = \underline{-4}$

3. $-3 \div -3 = \underline{1}$ 4. $14 \div -2 = \underline{-7}$

Question 3: Work out the missing numbers:

1) $\underline{-4} \times -8 = 32$

2) $6 \times \underline{9} = 54$

3) $\underline{-5} \times -10 = 50$

4) $\underline{-10} \times 8 = -80$

Question 4: Complete this multiplication table.

$\times$	-5	7	-3
2	$\underline{-10}$	$\underline{14}$	$\underline{-6}$
-6	$\underline{30}$	$\underline{-42}$	$\underline{18}$

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

$$\text{a) } 4 \times \underbrace{(-5 + 2)}_{-3} = \underline{-12}$$

$$\text{b) } -7 \times \underbrace{(-8 + 3)}_{-5} = \underline{35}$$

$$\text{c) } -3 \times \underbrace{(2 - -6)}_8 = \underline{-24}$$

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 $14\,107 \div 3$ to show this.’

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

Lowest common multiples

Common Multiples
multiples that
numbers share

Multiples of 2

Multiples of 3

Common
multiples
of 2 and 3

0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	...

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

Common Factors : 1, 3 and 9

HCF

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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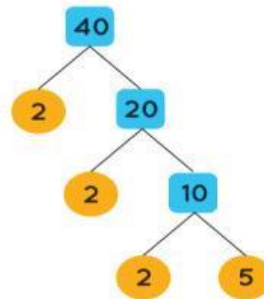
Prime factorization

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

Prime Factorization of 40

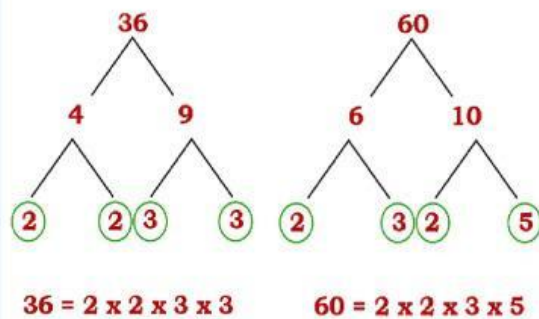
2	40
2	20
2	10
5	5
	1

or



$$\begin{aligned}\text{Prime factorization of } 40 &= 2 \times 2 \times 2 \times 5 \\ &= 2^3 \times 5\end{aligned}$$

Example 1: Find the HCF of 36 and 60



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

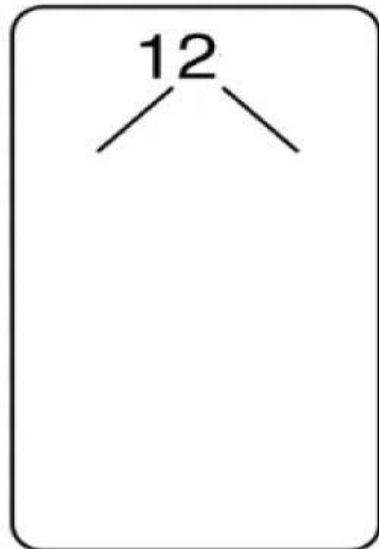
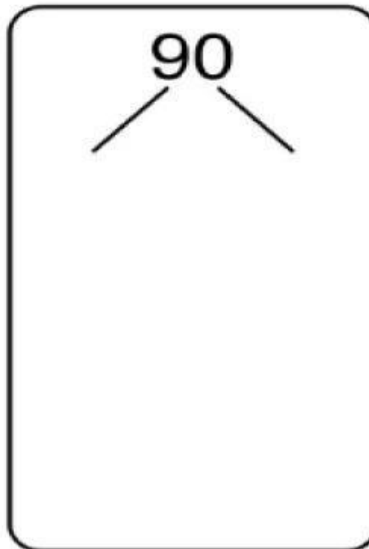
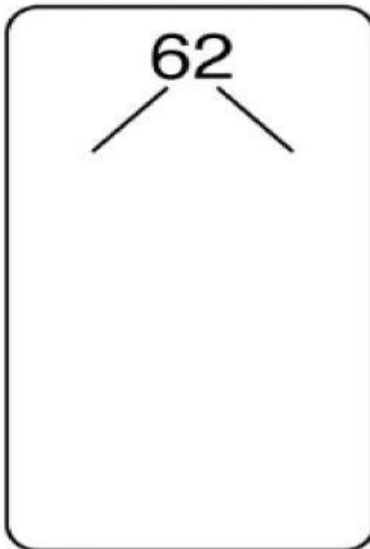
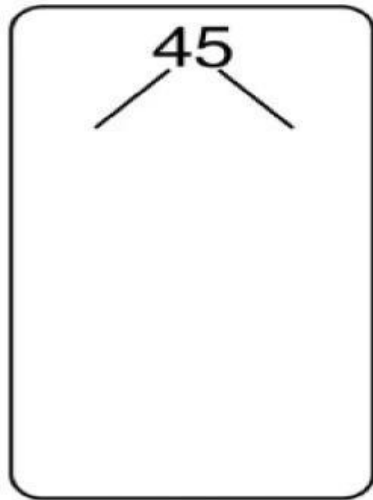
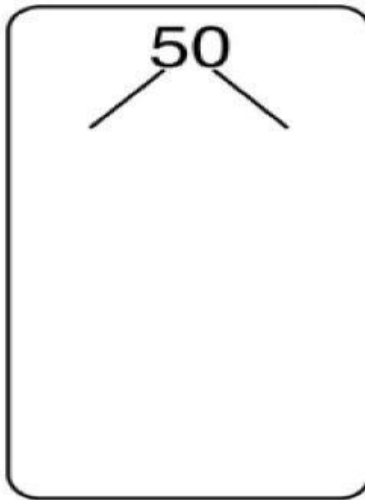
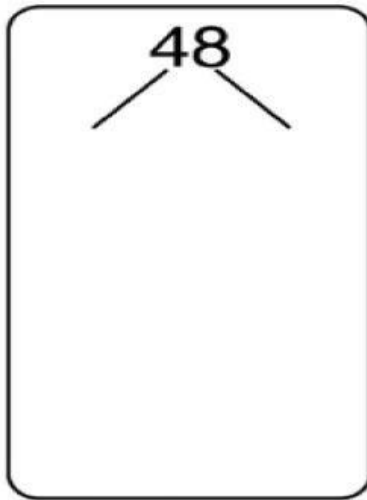
$$36 = 2 \times 2 \times 3 \times 3$$

$$60 = 2 \times 2 \times 3 \times 5$$

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

$$\text{HCF}(36, 60) = 2 \times 2 \times 3 = 12$$

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	$\sqrt{225} = 15$	$15^2 = 225$