# A DEFINITIONS

## A.1 CALCULATING MULTIPLICATIONS USING CUBES

## Ex 1:



#### Answer:

 $3 \times 2 = 2 + 2 + 2$ = 6

#### Ex 2:



#### Answer:

 $2 \times 4 = 4 + 4$ = 8

#### Ex 3:



Answer:

 $\begin{array}{l} 3\times5=5+5+5\\ =15\end{array}$ 

 $4 \times 3 = 3 + 3 + 3 + 3$ = 12

Ex 5:

Answer:



Answer:

 $2 \times 5 = 5 + 5$ = 10

Ex 6:



Answer:

$$5 \times 3 = 3 + 3 + 3 + 3 + 3$$
  
= 15

Ex 7:

 $3 \times 7 = 21$ 

Ex 4:





$$3 \times 7 = 7 + 7 + 7$$
  
= 14 + 7  
= 21

#### A.2 FINDING THE REPEATED ADDITIONS

Ex 8:

$$5 + 5 + 5 = 3 \times 5$$

Answer:

• Count the number of 5s:

 $\frac{1}{5} + \frac{2}{5} + \frac{3}{5}$ 

•  $5 + 5 + 5 = 3 \times 5$ 

Ex 9:

$$2 + 2 + 2 + 2 = 4 \times 2$$

Answer:

• Count the number of 2s:

 $\frac{1}{2} + \frac{2}{2} + \frac{3}{2} + \frac{4}{2}$ 

•  $2 + 2 + 2 + 2 = 4 \times 2$ 

Ex 10:

$$3 + 3 + 3 = 3 \times 3$$

Answer:

• Count the number of 3s:

 $\frac{1}{3} + \frac{2}{3} + \frac{3}{3}$ 

•  $3 + 3 + 3 = 3 \times 3$ 

### Ex 11:

$$9 + 9 + 9 + 9 + 9 = 5 \times 9$$

Answer:

• Count the number of 9s:

$$\frac{1}{9} + \frac{2}{9} + \frac{3}{9} + \frac{4}{9} + \frac{5}{9}$$

•  $9 + 9 + 9 + 9 + 9 = 5 \times 9$ 

## **B** IN NUMBER LINE

# B.1 CALCULATING MULTIPLICATIONS USING NUMBER LINE

Ex 12:

$$3 \times 2 = 6$$

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15 \quad 16 \quad 17 \quad 18 \quad 19 \quad 20$$

Answer:

• Start from 0 and jump 2 steps to the right, 3 times.

• 
$$3 \times 2 = 6$$

Ex 13:

$$2 \times 5 = 10$$
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Answer:

• Start from 0 and jump 5 steps to the right, 2 times.

• 
$$2 \times 5 = 10$$

Ex 14:

$$3 \times 6 = 18$$
  
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Answer:

 $\bullet\,$  Start from 0 and jump 6 steps to the right, 3 times.



•  $3 \times 6 = 18$ 

Ex 15:

$$2 \times 7 = 14$$

$$0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \ 11 \ 12 \ 13 \ 14 \ 15 \ 16 \ 17 \ 18 \ 19 \ 20$$

Answer:

• Start from 0 and jump 7 steps to the right, 2 times.





• 
$$2 \times 7 = 14$$

Ex 16:



Answer:

• Start from 0 and jump 5 steps to the right, 4 times.



•  $4 \times 5 = 20$ 

# C REPRESENTATION OF MULTIPLICATION IN WORD PROBLEMS

# C.1 SOLVING REAL-WORLD PROBLEMS WITH DRAWING

**Ex 17:** Hugo has three boxes of pencils. Each box has 5 pencils.



Hugo has 15 pencils in total.

Answer:

- Hugo has 3 groups of 5 pencils.
- Adding groups: 5 + 5 + 5 = 15 pencils.
- Hugo has 15 pencils in total.

**Ex 18:** Su has four boxes of marbles. Each box has 3 marbles.



Su has 12 marbles in total.

Answer:

- Su has 4 groups of 3 marbles.
- Adding groups: 3 + 3 + 3 + 3 = 12 marbles.
- Su has 12 marbles in total.

**Ex 19:** Louis has four containers of Lego bricks. Each container has 5 Lego bricks.



Louis has 20 Lego bricks in total.

Answer:

- Louis has 4 groups of 5 Lego bricks.
- Adding groups: 5 + 5 + 5 + 5 = 20 Lego bricks.
- Louis has 20 Lego bricks in total.

**Ex 20:** Alice has three jars of cookies. Each jar has 4 cookies.

$\bigcirc$	$\bigcirc$	$\bigcirc$

Alice has 12 cookies in total.

Answer:

- Alice has 3 groups of 4 cookies.
- Adding groups: 4 + 4 + 4 = 12 cookies.
- Alice has 12 cookies in total.

## C.2 SOLVING REAL-WORLD PROBLEMS

**Ex 21:** Larbi is building toy cars for a school project. He can build 5 toy cars each day. If he works for 3 days, how many toy cars will he have in total? Larbi will have 15 toy cars.

arbi will have 15 toy

Answer:

• Visualize the groups:



3 equal groups

- $\bullet\,$  Larbi has 3 groups of 5 toy cars.
- Calculation:  $3 \times 5 = 15$
- Total: Larbi has 15 toy cars.

**Ex 22:** A school is buying notebooks for its students. Each student needs 2 notebooks. If there are 6 students, how many notebooks does the school need to buy? The school needs to buy 12 notebooks.

Answer:

• Visualize the groups:





- There are 6 groups of 2 notebooks.
- Calculation:  $6 \times 2 = 12$
- Total: The school needs to buy 12 notebooks.

**Ex 23:** Emma has 3 boxes of eggs. Each box contains 6 eggs. How many eggs does Emma have in total? Emma has 18 eggs.

Answer:

• Visualize the groups:



- Emma has 3 groups of 6 eggs.
- Calculation:  $3 \times 6 = 18$
- Total: Emma has 18 eggs.

**Ex 24:** There are 5 people. Each person has 2 eyes. How many eyes are there in total? There are 10 eyes.

Answer:

• Visualize the groups:



 $5~{\rm equal~groups}$ 

- Calculate the multiplication:  $5 \times 2 = 10$
- There are 10 eyes in total.

## D COMMUTATIVE

D.1	PLAYING	WITH	THE	ORDER	OF
MULTI	PLICATION				

Ex 25:

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10 \times 2 = 20
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Answer:

- We can think of  $10 \times 2$  as adding 10 two times:
- $10 \times 2 = 2 \times 10$ = 10 + 10= 20
- So,  $10 \times 2 = 20$

Ex 26:

 $10 \times 3 = 30$ 

Answer:

- We can think of  $10 \times 3$  as adding 10 three times:
- $10 \times 3 = 3 \times 10$ = 10 + 10 + 10= 30
- So,  $10 \times 3 = 30$

Ex 27:

$$15 \times 2 = 30$$

Answer:

- We can think of  $15\times 2$  as adding 15 two times:
- $15 \times 2 = 2 \times 15$ = 15 + 15= 30
- So,  $15 \times 2 = 30$

Ex 28:

$$100 \times 2 = \boxed{200}$$

Answer:

- We can think of  $100\times 2$  as adding 100 two times:
- $100 \times 2 = 2 \times 100$ = 100 + 100= 200
- So,  $100 \times 2 = 200$

# E DISTRIBUTIVE WITH ADDITION

## E.1 BREAKING DOWN AT LEFT

Ex 29:

$$\begin{array}{rcl} 3 \times 8 & = & 2 \times 8 + 1 \times 8 \\ & = & \boxed{16} + 8 \end{array}$$



$2 \times 8$ $1 \times 8$
$3 \times 8$

 $3 \times 8 = 2 \times 8 + 1 \times 8$ = 16 + 8

#### Ex 30:



#### Answer:

Ex 31:



 $4 \times 7 = 3 \times 7 + 1 \times 7$ = 21 + 7

Answer:

$$7 \times 6 = 5 \times 6 + 2 \times 6$$
$$= 30 + 12$$

Ex 32:



Answer:

$$11 \times 4 = 10 \times 4 + 1 \times 4$$
$$= 40 + 4$$





Answer:

$$8 \times 6 = 5 \times 6 + 3 \times 6$$
$$= 30 + 18$$

Ex 34:

5



$$11 \times 6 = 10 \times 6 + 1 \times 6$$
$$= 60 + 6$$

#### E.2 BREAKING DOWN AT RIGHT

Ex 35:



Answer:

$$7 \times 3 = 7 \times 2 + 7 \times 1$$
$$= 14 + 7$$

Ex 36:



Answer:



Ex 37:

$$\begin{array}{rcl}
6 \times 7 &=& 6 \times 5 + 6 \times 2 \\
 &=& 30 + 12
\end{array}$$



 $6 \times 7 = 6 \times 5 + 6 \times 2$ = 30 + 12

Answer:

Ex 38:



Answer:

- -- - -

 $6 \times 11 = 6 \times 10 + 6 \times 1$ = 60 + 6

Ex 39:



 $7 \times 6 = 7 \times 5 + 7 \times 1$ = 35 + 7

Answer:



## E.3 BREAKING DOWN AT LEFT

#### Ex 40:

$3 \times 8 = 24$
$2 \times 8  1 \times 8$
<b>777</b>
$\underbrace{}_{3\times8}$



3	×	8	=	$2 \times 8 + 1 \times 8$
			=	16 + 8
			=	24





#### Answer:

$4 \times 7 =$	$3 \times 7 + 1 \times 7$
=	21 + 7
=	28

Ex 42:

$$7 \times 6 = 42$$



Answer:

 $7 \times 6 = 5 \times 6 + 2 \times 6$ = 30 + 12= 42

Ex 43:



Answer:

 $11 \times 4 = 10 \times 4 + 1 \times 4$ = 40 + 4= 44

Ex 44:



Answer:

 $8 \times 6 = 5 \times 6 + 3 \times 6$ = 30 + 18= 48

Ex 45:





$$11 \times 6 = 10 \times 6 + 1 \times 6$$
$$= 60 + 6$$
$$= 66$$



3

 $8 \times 1$ 

 $8 \times 4 = 8 \times 3 + 8 \times 1$ = 24 + 8= 32

Ex 48:

Answer:

## E.4 BREAKING DOWN AT RIGHT

#### Ex 46:



#### Answer:

$$7 \times 3 = 7 \times 2 + 7 \times 1$$
$$= 14 + 7$$
$$= 21$$

Ex 47:

 $8 \times 4 = 32$ 



Answer:

 $6 \times 7 = 6 \times 5 + 6 \times 2$ = 30 + 12= 42

Ex 49:





$$6 \times 11 = 6 \times 10 + 6 \times 1$$
$$= 60 + 6$$
$$= 66$$

Ex 50:





 $7 \times 6 = 7 \times 5 + 7 \times 1$ = 35 + 7= 42

## F DISTRIBUTIVE WITH SUBTRACTION

#### F.1 BREAKING DOWN AT LEFT

Ex 51:



Answer:

$$9 \times 3 = 10 \times 3 - 1 \times 3$$
$$= 30 - 3$$

Ex 52:

$$9 \times 5 = 10 \times 5 - 1 \times 5$$
$$= 50 - 5$$



 $10 \times 5$ 

Answer:

 $9 \times 5 = 10 \times 5 - 1 \times 5$ = 50 - 5

Ex 53:



 $10 \times 7$ 

 $\begin{array}{l} 9\times7=10\times7-1\times7\\ =70-7 \end{array}$ 

Answer:

Ex 54:



Answer:

 $9 \times 6 = 10 \times 6 - 1 \times 6$ = 60 - 6



#### F.2 BREAKING DOWN AT RIGHT

3

#### Ex 55:



Answer:

$$8 = 3 \times 10 - 3 \times 1$$
$$= 30 - 3$$

Ex 56:



Answer:

$$4 \times 9 = 4 \times 10 - 4 \times 1$$
$$= 40 - 4$$

Ex 57:



Answer:

$$8 \times 9 = 8 \times 10 - 8 \times 1$$
$$= 80 - 8$$

F.3 BREAKING DOWN AT LEFT

Ex 58:



Answer:

 $9 \times 3 = 10 \times 3 - 1 \times 3$ = 30 - 3= 27

Ex 59:



Answer:

nswer:

 $9 \times 5 = 10 \times 5 - 1 \times 5$ = 50 - 5= 45

Ex 60:



Answer:

9





 $9 \times 6 = 10 \times 6 - 1 \times 6$ = 60 - 6= 54

Answer:

 $8 \times 9 = 8 \times 10 - 8 \times 1$ = 80 - 8= 72

#### F.4 BREAKING DOWN AT RIGHT

Ex 62:



Answer:

 $3 \times 9 = 3 \times 10 - 3 \times 1$ = 30 - 3 = 27





Answer:





