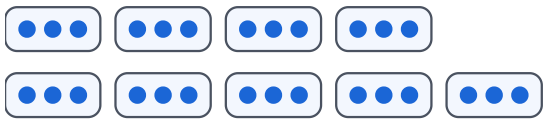
Names (pair) _____ Date _____

Divisibility of Sums, Differences and Products

EXTENSION

Example



Put 12 and 15 into threes. Together they are still made only of threes, so $12 + 15 = 27$ is divisible by 3 too.

1 IN PAIRS Investigate the sums. Is the sum divisible by 3?

A: both divisible by 3

a	b	$a + b$	divisible by 3?
12	15	$12 + 15 =$ ☐	yes / no
21	9	$21 + 9 =$ ☐	yes / no
30	6	$30 + 6 =$ ☐	yes / no

B: one divisible, one not

a	b	$a + b$	divisible by 3?
6	4	$6 + 4 =$ ☐	yes / no
9	5	$9 + 5 =$ ☐	yes / no
15	7	$15 + 7 =$ ☐	yes / no

C: neither divisible by 3

a	b	$a + b$	divisible by 3?
4	5	$4 + 5 =$ ☐	yes / no
7	10	$7 + 10 =$ ☐	yes / no
8	11	$8 + 11 =$ ☐	yes / no

What do you conclude in cases A, B and C? Is the same true for the difference of the larger and the smaller number?

Remember

If **both** numbers are divisible by d, so are their sum and difference. If one is divisible by d and the other is not, the sum is **not** divisible by d. If neither is divisible by d, the sum **may or may not** be divisible by d.

Names (pair) _____ Date _____

Example

Products. If at least one factor is divisible by d, so is the product: 15 is divisible by 5, so $15 \times 4 = 60$ is too. The reverse is not always true: $6 \times 10 = 60$ is divisible by 4, but neither 6 nor 10 is (a two from 6 and a two from 10 together make 4).

2 IN PAIRS True or false? Correct the false statements with a counterexample.

a) If a is divisible by 5, then $a \times b$ is divisible by 5. **true** / **false**

Correction: _____

b) If $a \times b$ is divisible by 4, then a or b is divisible by 4. **true** / **false**

Correction: _____

c) If $a + b$ is divisible by 3, then a and b are both divisible by 3. **true** / **false**

Correction: _____

3 ON YOUR OWN Decide without calculating, then explain.

Is $35 + 49$ divisible by 7? **yes** / **no**

Is $120 - 45$ divisible by 5? **yes** / **no**

Is $36 + 25$ divisible by 9? **yes** / **no**

Is 18×25 divisible by 9? **yes** / **no**

Is 14×15 divisible by 10? **yes** / **no**

The Set of Objects app · otooly.com/set-of-objects

Put 12 and 15 objects into groups of 3, then join them. What about 13 and 15?

★ ON YOUR OWN **Exit card.** The sum of three consecutive whole numbers (e.g. $4 + 5 + 6$) is always divisible by 3. Check two more examples: _____