2.2 Developing Rules to Multiply Integers

Quick Review

At Home At School

➤ Integers have these properties of whole numbers.

- **Multiplying by 0:** $4 \times 0 = 0$ and $0 \times 4 = 0$
  So, $(-4) \times 0 = 0$ and $0 \times (-4) = 0$
- **Multiplying by 1:** $4 \times 1 = 4$ and $1 \times 4 = 4$
  So, $(-4) \times (+1) = -4$ and $(+1) \times (-4) = -4$
- **Commutative Property:** $4 \times 2 = 8$ and $2 \times 4 = 8$
  So, $(-4) \times (+2) = -8$ and $(+2) \times (-4) = -8$
- **Distributive Property:** $4 \times (2 + 3) = 4 \times 2 + 4 \times 3 = 20$
  So, $(-4) \times [(+2) + (+3)] = (-4) \times (+2) + (-4) \times (+3) = -20$

➤ You can write the product of integers without the use of the × sign.
$(-4) \times (+2)$ can simply be written as: $(-4)(+2)$

➤ When 2 integers with the same sign are multiplied, their product is positive.
$(+2)(+3) = +6$ $(-2)(-3) = +6$

When 2 integers with different signs are multiplied, their product is negative.
$(+2)(-3) = -6$ $(-2)(+3) = -6$

Practice

1. Find a pattern rule for each multiplication pattern. Extend the pattern for 3 more rows.

HINT

To find a pattern rule, look for a pattern in the integer factors and in the products.

a) $(+3)(+3) = +9$

$(+2)(+3) = +6$

$(+1)(+3) = +3$

$(0)(+3) =$ _____

(_____)$(+3) =$ _____

_____

_____

b) $(-3)(+3) = -9$

$(-3)(+2) = -6$

$(-3)(+1) = -3$

$(-3)(0) =$ _____

_____

_____

_____

2. In this chart, write the sign of each product of multiplying 2 integers.

×	positive integer	negative integer
positive integer		
negative integer		

- When 2 integer factors have the same sign, their product is _____.
- When 2 integer factors have different signs, their product is _____.

3. Find each product.

a) (+7)(–2) = _____ **b)** (–4)(–3) = _____ **c)** (–8)(+9) = _____

d) (+10)(–5) = _____ **e)** (+5)(–7) = _____ **f)** (–9)(–4) = _____

i) (–7)(–1) = _____ **j)** (+5)(0) = _____ **k)** (+20)(–20) = _____

4. Fill in the blank to make each equation true.

a) (+7) × _____ = –35 **b)** _____ × (–9) = +99 **c)** (–10) × _____ = –320

d) _____ × (–5) = +20 **e)** (+7) × _____ = –49 **f)** _____ × (+13) = –65

g) _____ × (–15) = –180 **h)** (+14) × _____ = –140 **i)** _____ × (–7) = 56

5. Match each pattern rule with the corresponding pattern.
Complete each pattern and pattern rule.

Number Pattern	**Pattern Rule**
–3, +9, –27, + 81, . . .	Start at 2. Multiply by _____ each time.
+2, –10, +50, –250, . . .	Start at 1. Multiply by –10 each time.
+3, –3, _____, _____, . . .	Start at _____. Multiply by –3 each time.
+1, –10, _____, _____, . . .	Start at 3. Multiply by –1 each time.
–1, –2, –4, –8, –16, . . .	Start at –1. Multiply by _____ each time.