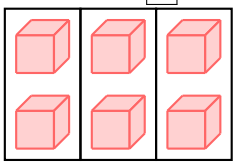
MULTIPLICATION

A DEFINITIONS

A.1 CALCULATING MULTIPLICATIONS USING CUBES

Ex 1:

$3 \times 2 = \boxed{6}$

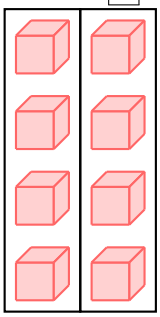


Answer:

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

Ex 2:

$2 \times 4 = \boxed{8}$

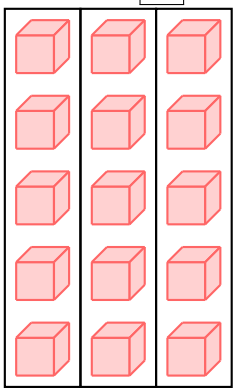


Answer:

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

Ex 3:

$3 \times 5 = \boxed{15}$

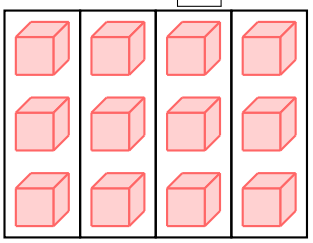


Answer:

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

Ex 4:

$4 \times 3 = \boxed{12}$

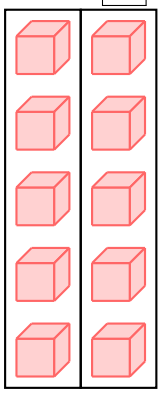


Answer:

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

Ex 5:

$2 \times 5 = \boxed{10}$

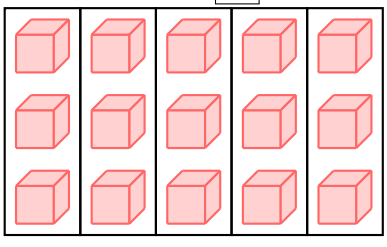


Answer:

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

Ex 6:

$5 \times 3 = \boxed{15}$

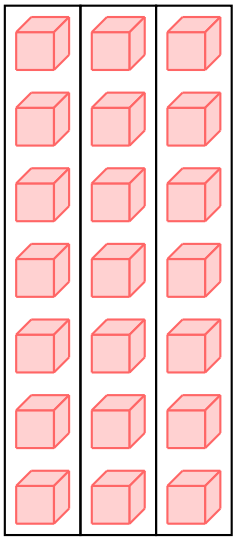


Answer:

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

Ex 7:

$3 \times 7 = \boxed{21}$



Answer:

$$\begin{aligned} 3 \times 7 &= 7 + 7 + 7 \\ &= 14 + 7 \\ &= 21 \end{aligned}$$

A.2 FINDING THE REPEATED ADDITIONS

Ex 8:

$$5 + 5 + 5 = \boxed{3} \times 5$$

Answer:

- Count the number of 5s:

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

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

Ex 9:

$$2 + 2 + 2 + 2 = \boxed{4} \times 2$$

Answer:

- Count the number of 2s:

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

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

Ex 10:

$$3 + 3 + 3 = \boxed{3} \times 3$$

Answer:

- Count the number of 3s:

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

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

Ex 11:

$$9 + 9 + 9 + 9 + 9 = \boxed{5} \times 9$$

Answer:

- Count the number of 9s:

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

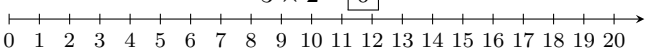
- $9 + 9 + 9 + 9 + 9 = 5 \times 9$

B IN NUMBER LINE

B.1 CALCULATING MULTIPLICATIONS USING NUMBER LINE

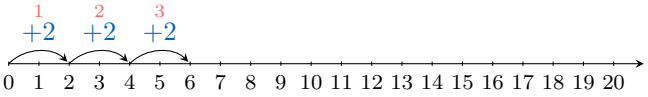
Ex 12:

$3 \times 2 = \boxed{6}$



Answer:

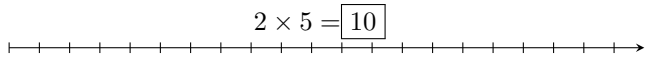
- Start from 0 and jump 2 steps to the right, 3 times.



- $3 \times 2 = 6$

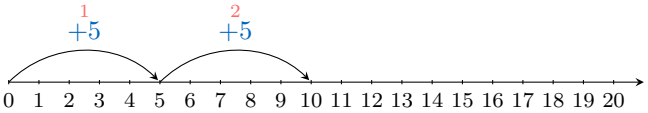
Ex 13:

$2 \times 5 = \boxed{10}$



Answer:

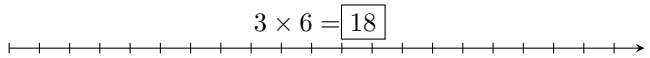
- Start from 0 and jump 5 steps to the right, 2 times.



- $2 \times 5 = 10$

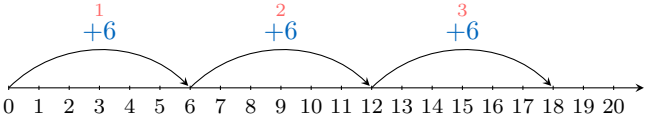
Ex 14:

$3 \times 6 = \boxed{18}$



Answer:

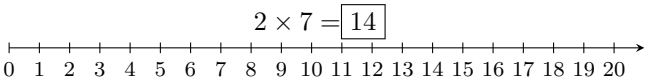
- Start from 0 and jump 6 steps to the right, 3 times.



- $3 \times 6 = 18$

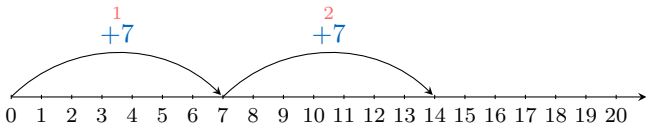
Ex 15:

$2 \times 7 = \boxed{14}$



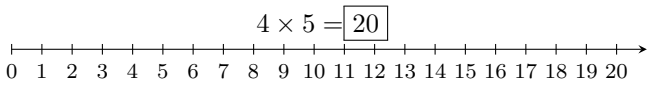
Answer:

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



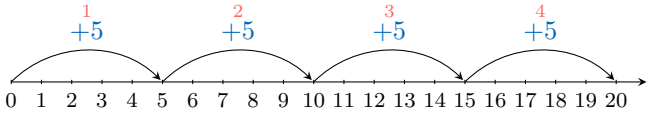
- $2 \times 7 = 14$

Ex 16:



Answer:

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

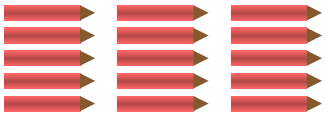


- $4 \times 5 = 20$

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.

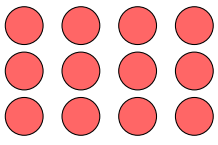


Hugo has $\boxed{15}$ pencils in total.

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.

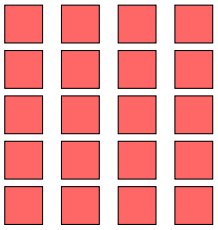


Su has $\boxed{12}$ marbles in total.

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.

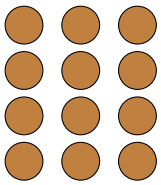


Louis has $\boxed{20}$ Lego bricks in total.

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.



Alice has $\boxed{12}$ cookies in total.

Answer:

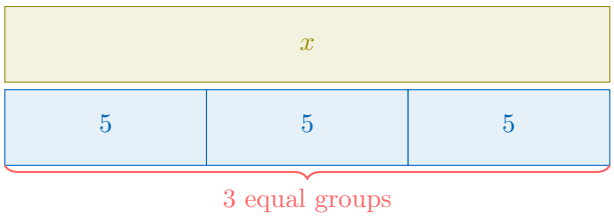
- Alice has 3 groups of 4 cookies.
- Adding groups: $4 + 4 + 4 = 12$ cookies.
- Alice has 12 cookies in total.

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 $\boxed{15}$ toy cars.

Answer:

- Visualize the groups:

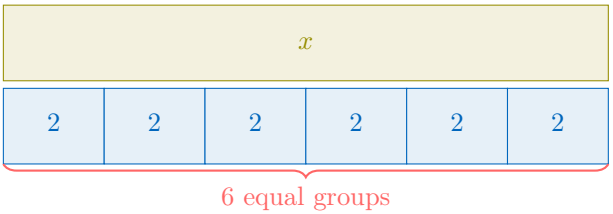


- Larbi has 3 groups of 5 toy cars.
- Calculation: $3 \times 5 = 15$
- Total: Larbi has 15 toy cars.

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 $\boxed{12}$ notebooks.

Answer:

- Visualize the groups:

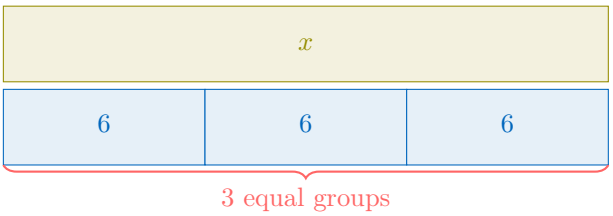


- There are 6 groups of 2 notebooks.
- Calculation: $6 \times 2 = 12$
- Total: The school needs to buy 12 notebooks.

Ex 23: Emma has 3 boxes of eggs. Each box contains 6 eggs. How many eggs does Emma have in total?
Emma has $\boxed{18}$ eggs.

Answer:

- Visualize the groups:

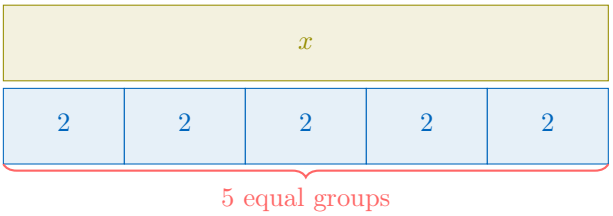


- Emma has 3 groups of 6 eggs.
- Calculation: $3 \times 6 = 18$
- Total: Emma has 18 eggs.

Ex 24: There are 5 people. Each person has 2 eyes. How many eyes are there in total?
There are $\boxed{10}$ eyes.

Answer:

- Visualize the groups:



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

D COMMUTATIVE

D.1 PLAYING WITH THE ORDER OF MULTIPLICATION

Ex 25:

$$10 \times 2 = \boxed{20}$$

Answer:

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

Ex 26:

$$10 \times 3 = \boxed{30}$$

Answer:

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

Ex 27:

$$15 \times 2 = \boxed{30}$$

Answer:

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

Ex 28:

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

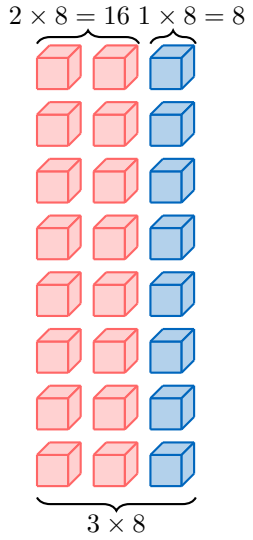
Answer:

- We can think of 100×2 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

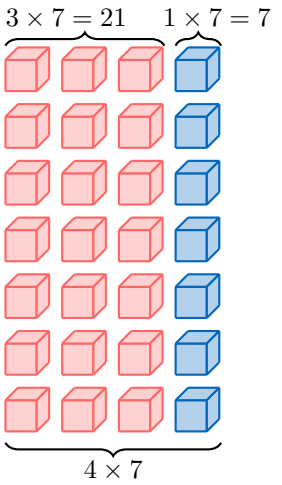
Ex 29: $3 \times 8 = \boxed{16} + \boxed{8}$



Answer:

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

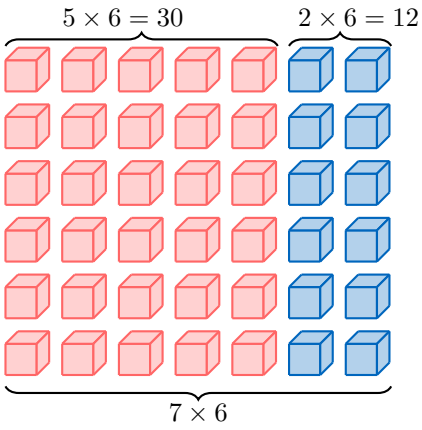
Ex 30: $4 \times 7 = \boxed{21} + \boxed{7}$



Answer:

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

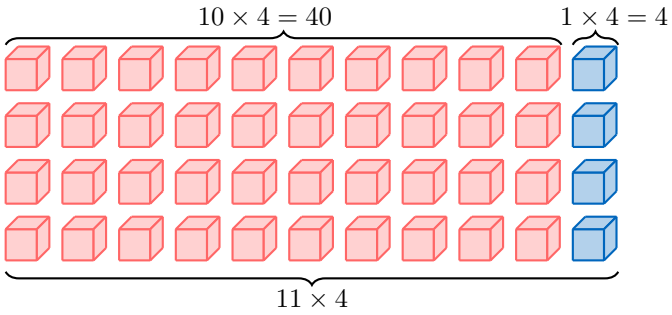
Ex 31: $7 \times 6 = \boxed{30} + \boxed{12}$



Answer:

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

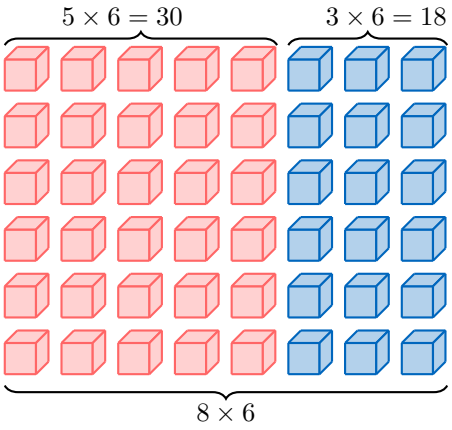
Ex 32: $11 \times 4 = \boxed{40} + \boxed{4}$



Answer:

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

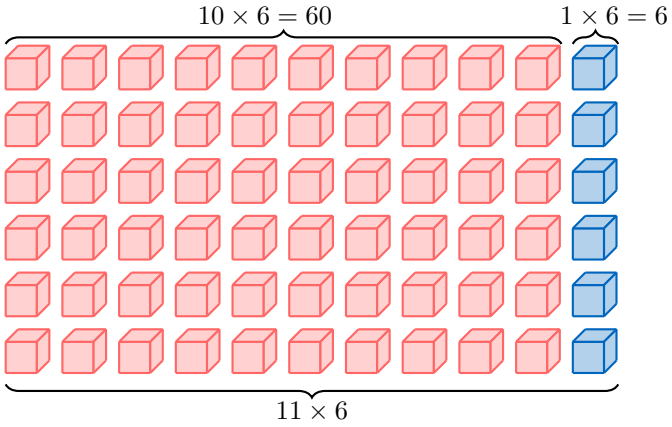
Ex 33: $8 \times 6 = \boxed{30} + \boxed{18}$



Answer:

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

Ex 34: $11 \times 6 = \boxed{60} + \boxed{6}$

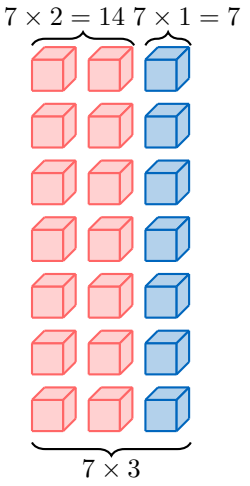


Answer:

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

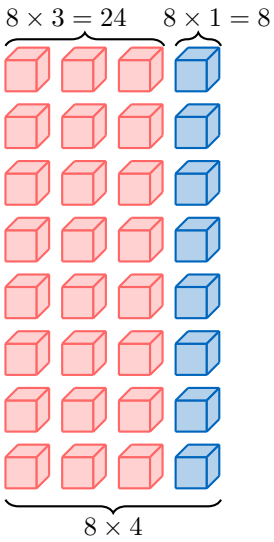
E.2 BREAKING DOWN AT RIGHT

Ex 35: $7 \times 3 = \boxed{14} + \boxed{7}$



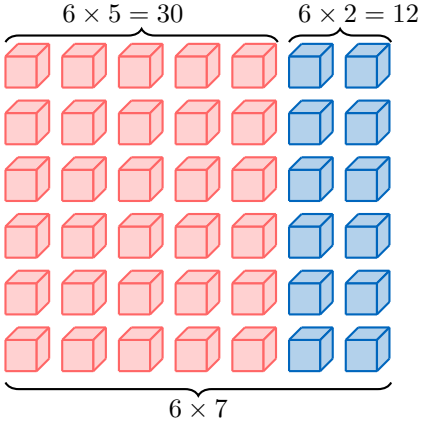
Answer: $7 \times 3 = (7 \times 2) + (7 \times 1)$
$= 14 + 7$

Ex 36: $8 \times 4 = \boxed{24} + \boxed{8}$



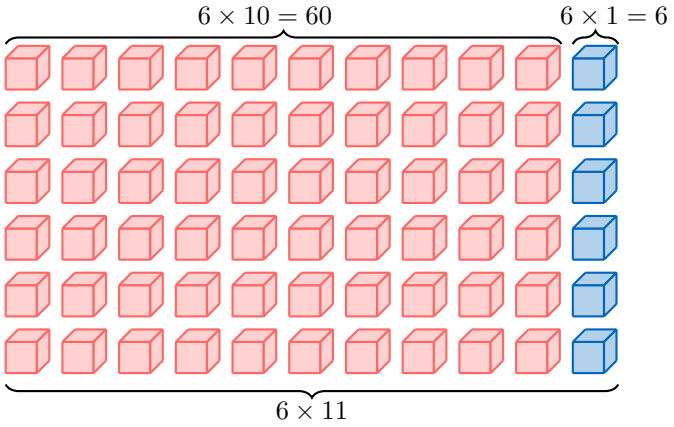
Answer: $8 \times 4 = (8 \times 3) + (8 \times 1)$
$= 24 + 8$

Ex 37: $6 \times 7 = \boxed{30} + \boxed{12}$



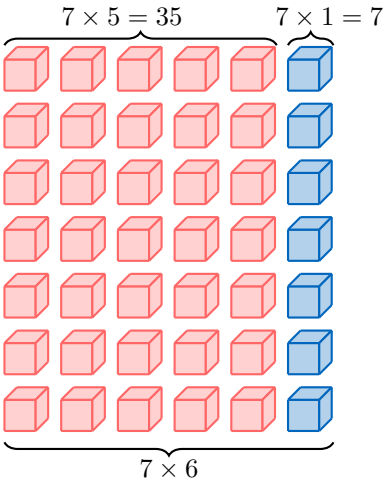
Answer: $6 \times 7 = (6 \times 5) + (6 \times 2)$
$= 30 + 12$

Ex 38: $6 \times 11 = \boxed{60} + \boxed{6}$



Answer: $6 \times 11 = (6 \times 10) + (6 \times 1)$
$= 60 + 6$

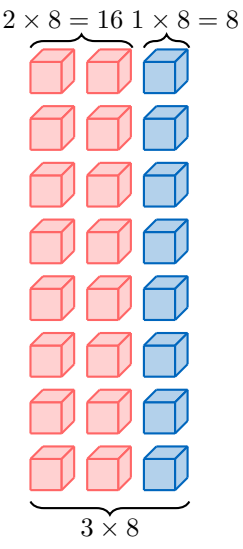
Ex 39: $7 \times 6 = \boxed{35} + \boxed{7}$



Answer: $7 \times 6 = (7 \times 5) + (7 \times 1)$
$= 35 + 7$

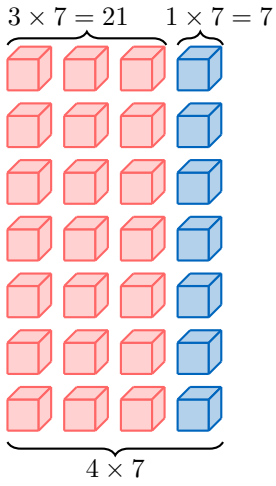
E.3 BREAKING DOWN AT LEFT

Ex 40: $3 \times 8 = \boxed{24}$



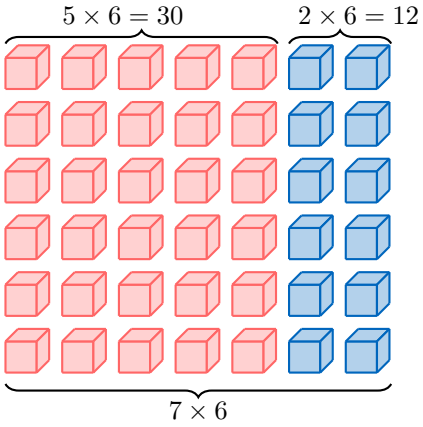
Answer: $3 \times 8 = (2 \times 8) + (1 \times 8)$
$= 16 + 8$
$= 24$

Ex 41: $4 \times 7 =$ $\boxed{28}$



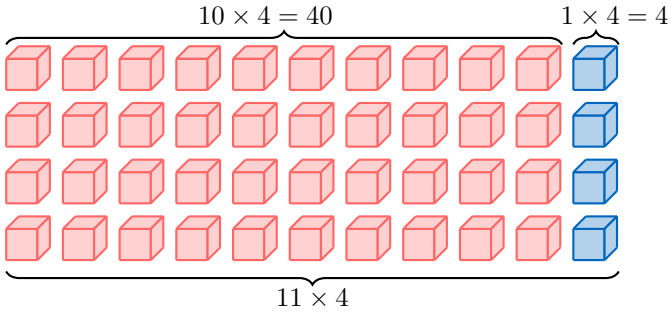
Answer: $4 \times 7 = (3 \times 7) + (1 \times 7)$
$= 21 + 7$
$= 28$

Ex 42: $7 \times 6 =$ $\boxed{42}$



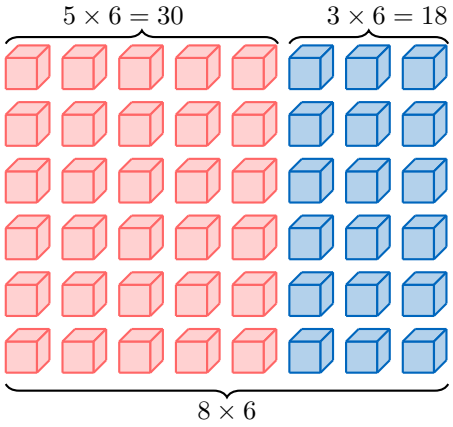
Answer: $7 \times 6 = (5 \times 6) + (2 \times 6)$
$= 30 + 12$
$= 42$

Ex 43: $11 \times 4 =$ $\boxed{44}$



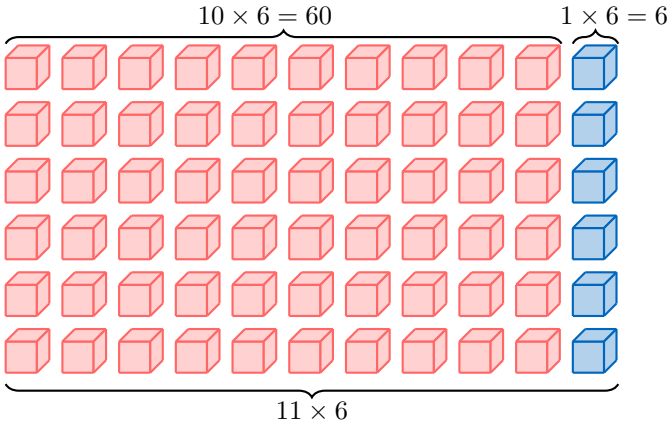
Answer: $11 \times 4 = (10 \times 4) + (1 \times 4)$
$= 40 + 4$
$= 44$

Ex 44: $8 \times 6 =$ $\boxed{48}$



Answer: $8 \times 6 = (5 \times 6) + (3 \times 6)$
$= 30 + 18$
$= 48$

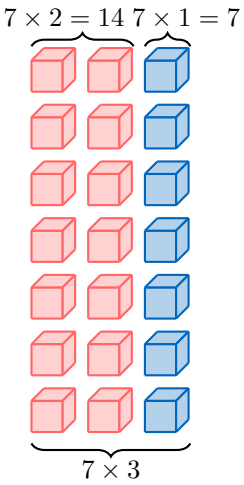
Ex 45: $11 \times 6 =$ $\boxed{66}$



Answer: $11 \times 6 = (10 \times 6) + (1 \times 6)$
$= 60 + 6$
$= 66$

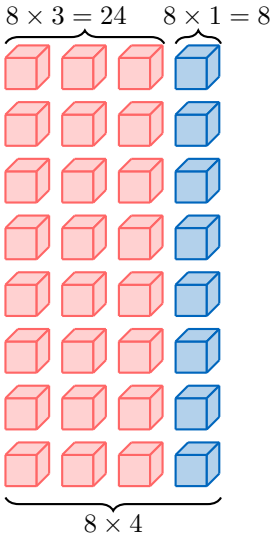
E.4 BREAKING DOWN AT RIGHT

Ex 46: $7 \times 3 =$ $\boxed{21}$



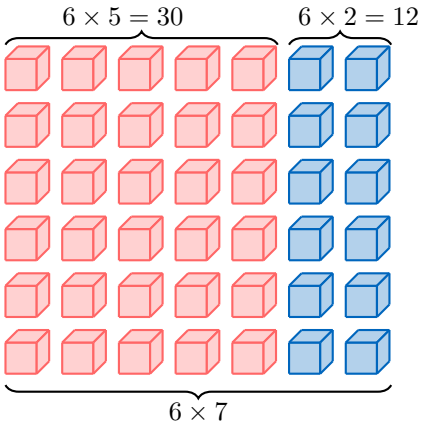
Answer: $7 \times 3 = (7 \times 2) + (7 \times 1)$
$= 14 + 7$
$= 21$

Ex 47: $8 \times 4 =$ $\boxed{32}$



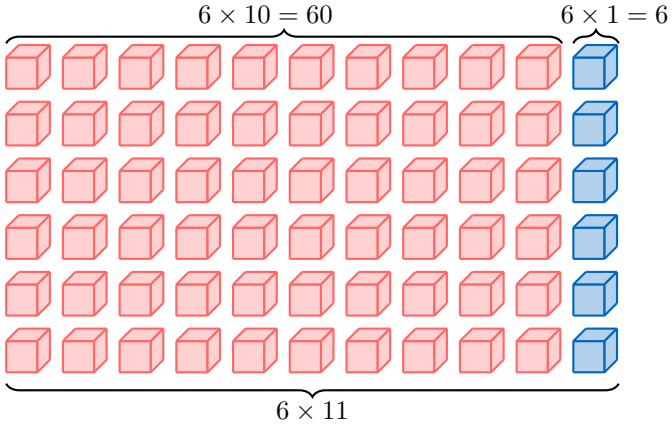
Answer: $8 \times 4 = (8 \times 3) + (8 \times 1)$
$= 24 + 8$
$= 32$

Ex 48: $6 \times 7 =$ 42



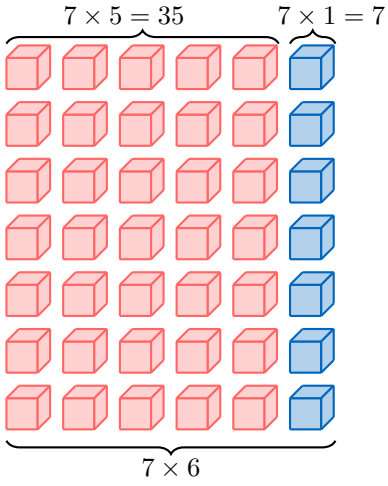
Answer: $6 \times 7 = (6 \times 5) + (6 \times 2)$
$= 30 + 12$
$= 42$

Ex 49: $6 \times 11 =$ 66



Answer: $6 \times 11 = (6 \times 10) + (6 \times 1)$
$= 60 + 6$
$= 66$

Ex 50: $7 \times 6 =$ 42

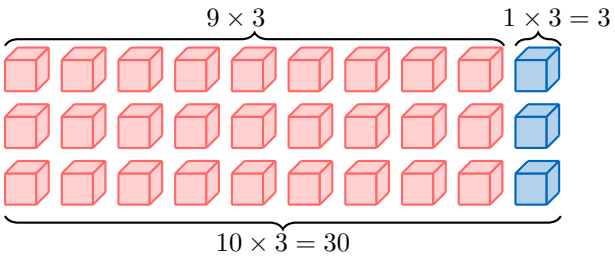


Answer: $7 \times 6 = (7 \times 5) + (7 \times 1)$
$= 35 + 7$
$= 42$

F DISTRIBUTIVE WITH SUBTRACTION

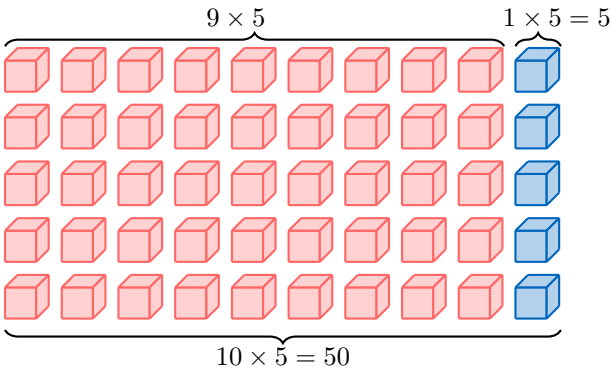
F.1 BREAKING DOWN AT LEFT

Ex 51: $9 \times 3 =$ 30 - 3



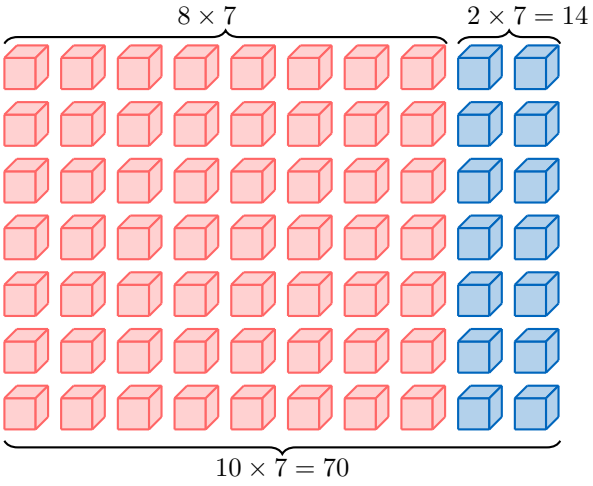
Answer: $9 \times 3 = (10 \times 3) - (1 \times 3)$
$= 30 - 3$

Ex 52: $9 \times 5 =$ 50 - 5



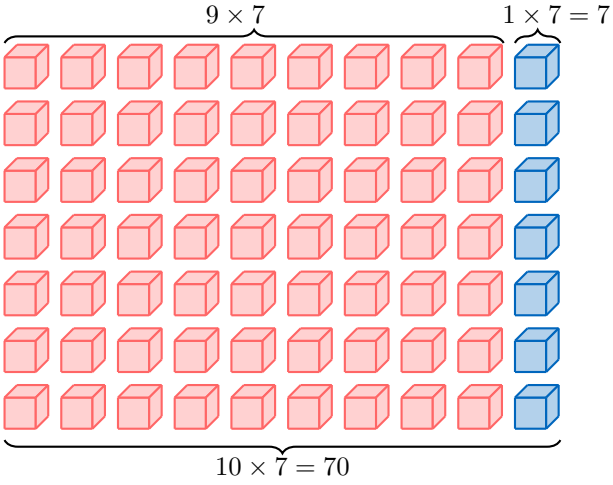
Answer: $9 \times 5 = (10 \times 5) - (1 \times 5)$
$= 50 - 5$

Ex 53: $8 \times 7 =$ 70 - 14



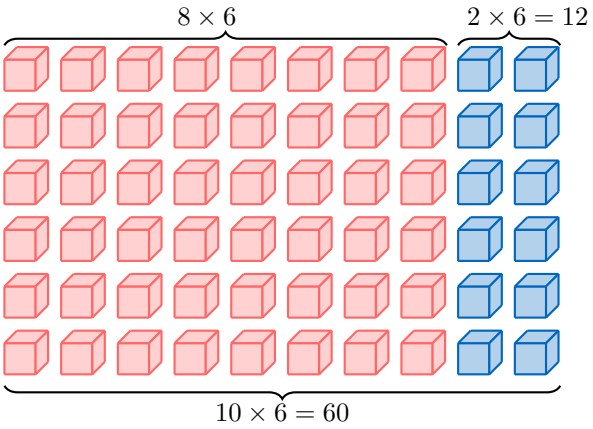
Answer: $8 \times 7 = (10 \times 7) - (2 \times 7)$
$= 70 - 14$

Ex 54: $9 \times 7 =$ 70 - 7



Answer: $9 \times 7 = (10 \times 7) - (1 \times 7)$
$= 70 - 7$

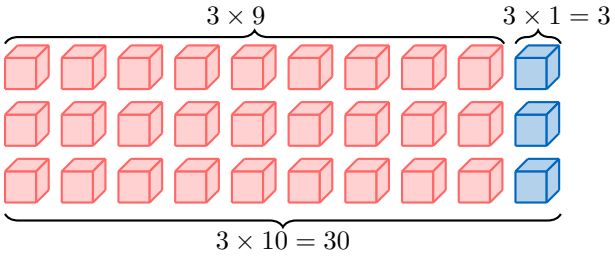
Ex 55: $8 \times 6 =$ 60 - 12



Answer: $8 \times 6 = (10 \times 6) - (2 \times 6)$
$= 60 - 12$

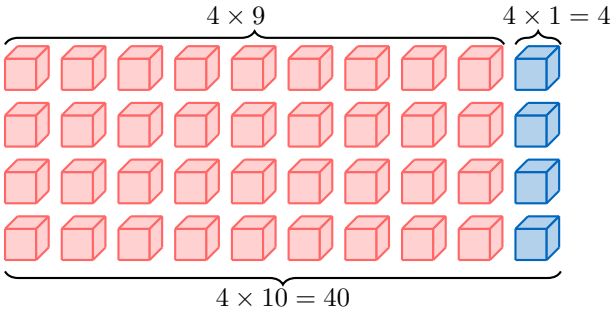
F.2 BREAKING DOWN AT RIGHT

Ex 56: $3 \times 9 =$ 30 - 3



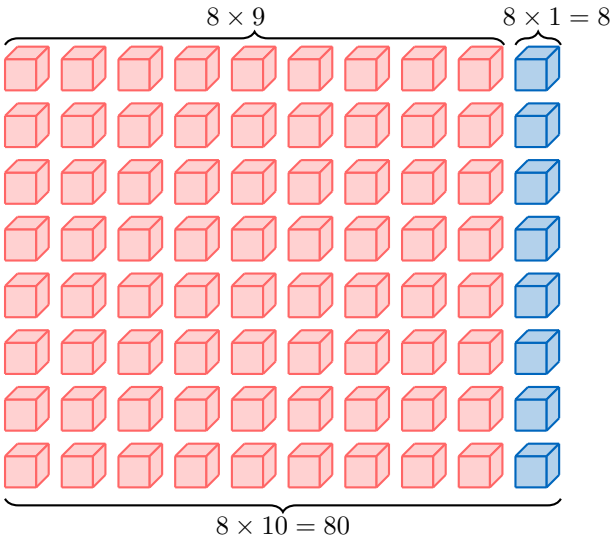
Answer: $3 \times 9 = (3 \times 10) - (3 \times 1)$
$= 30 - 3$

Ex 57: $4 \times 9 =$ 40 - 4



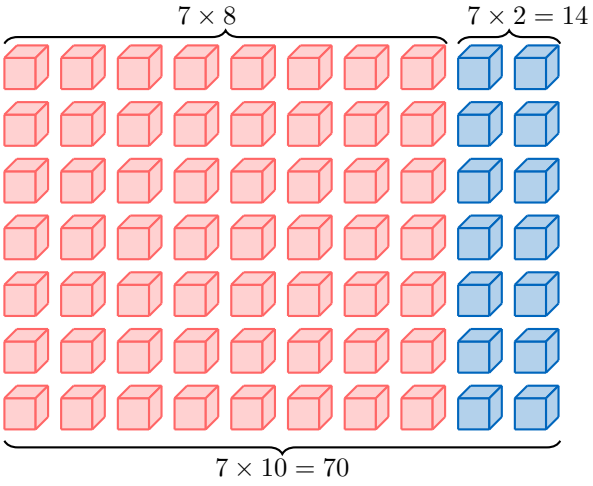
Answer: $4 \times 9 = (4 \times 10) - (4 \times 1)$
$= 40 - 4$

Ex 58: $8 \times 9 =$ 80 - 8



Answer: $8 \times 9 = (8 \times 10) - (8 \times 1)$
$= 80 - 8$

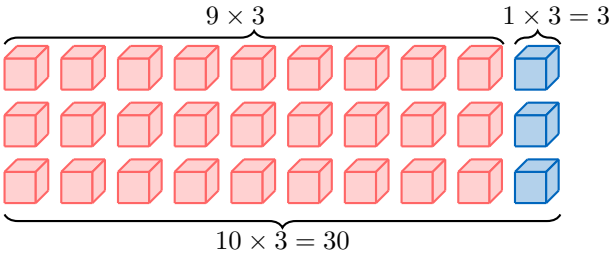
Ex 59: $7 \times 8 =$ 70 - 14



Answer: $7 \times 8 = (7 \times 10) - (7 \times 2)$
$= 70 - 14$

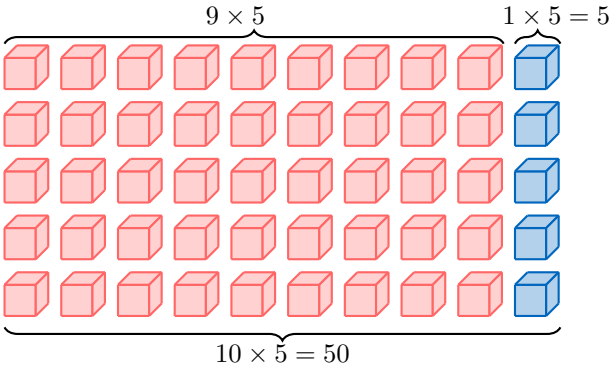
F.3 BREAKING DOWN AT LEFT

Ex 60: $9 \times 3 = \boxed{27}$



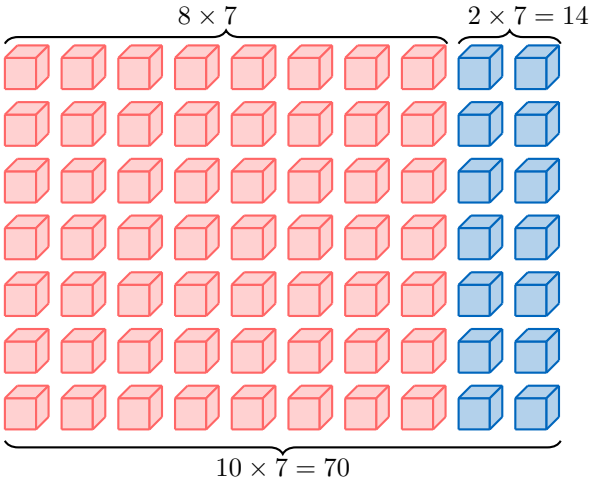
Answer: $9 \times 3 = (10 \times 3) - (1 \times 3)$
$= 30 - 3$
$= 27$

Ex 61: $9 \times 5 = \boxed{45}$



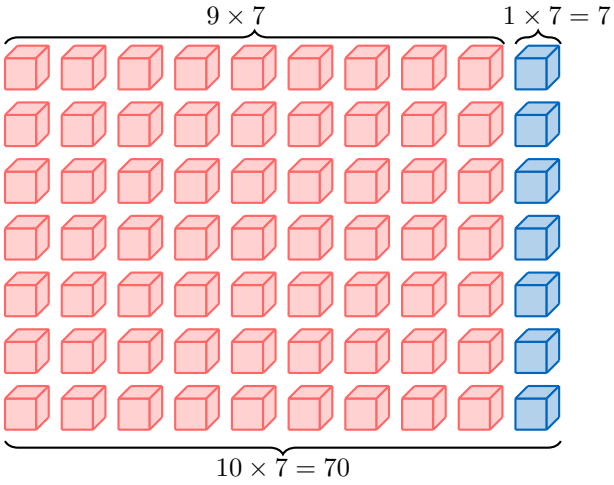
Answer: $9 \times 5 = (10 \times 5) - (1 \times 5)$
$= 50 - 5$
$= 45$

Ex 62: $8 \times 7 = \boxed{56}$



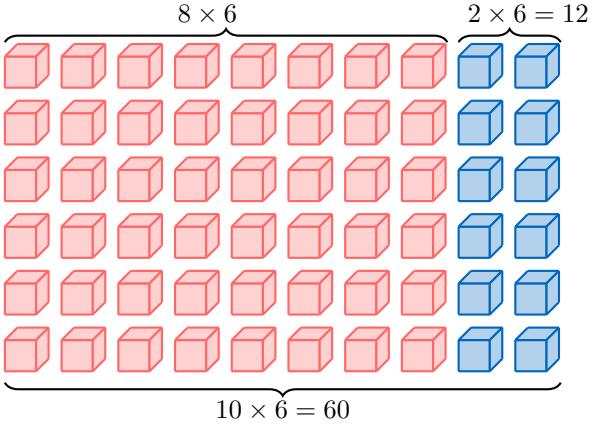
Answer: $8 \times 7 = (10 \times 7) - (2 \times 7)$
$= 70 - 14$
$= 56$

Ex 63: $9 \times 7 = \boxed{63}$



Answer: $9 \times 7 = (10 \times 7) - (1 \times 7)$
$= 70 - 7$
$= 63$

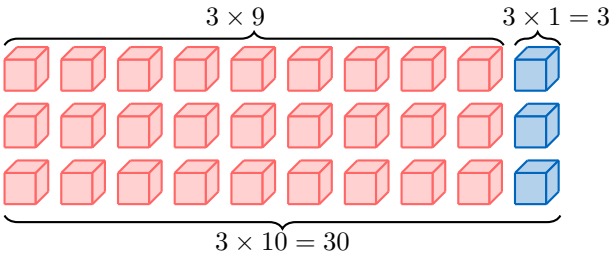
Ex 64: $8 \times 6 = \boxed{48}$



Answer: $8 \times 6 = (10 \times 6) - (2 \times 6)$
$= 60 - 12$
$= 48$

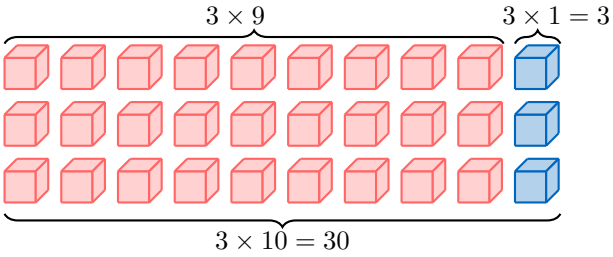
F.4 BREAKING DOWN AT RIGHT

Ex 65: $3 \times 9 = \boxed{27}$



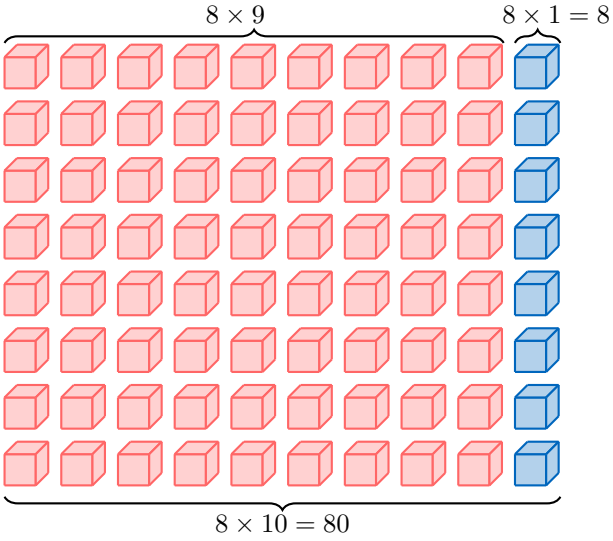
Answer: $3 \times 9 = (3 \times 10) - (3 \times 1)$
$= 30 - 3$
$= 27$

Ex 66: $4 \times 9 = \boxed{36}$



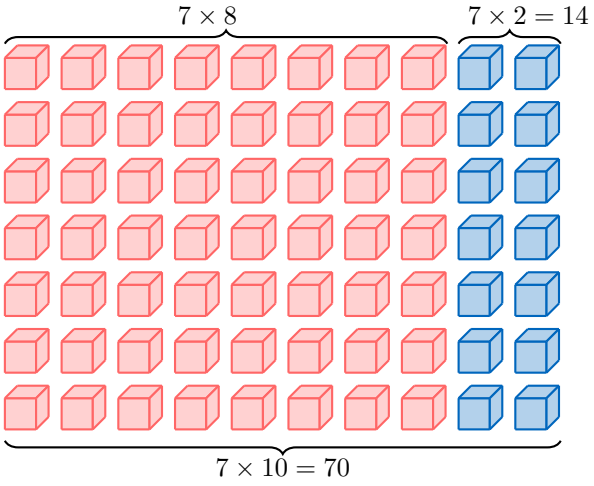
Answer: $4 \times 9 = (4 \times 10) - (4 \times 1)$
$= 40 - 4$
$= 36$

Ex 67: $8 \times 9 = \boxed{72}$



Answer: $8 \times 9 = (8 \times 10) - (8 \times 1)$
$= 80 - 8$
$= 72$

Ex 68: $7 \times 8 = \boxed{70} - \boxed{14}$



Answer: $7 \times 8 = (7 \times 10) - (7 \times 2)$
$= 70 - 14$
$= 56$