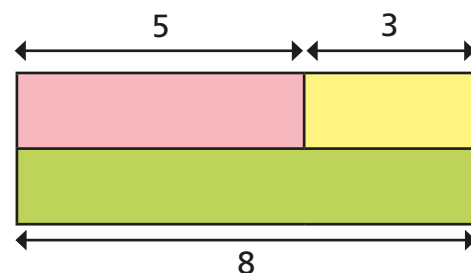


# Understand and use fact families, numerically and algebraically

1 The bar model shows these facts:

$$5 + 3 = 8$$

$$8 - 3 = 5$$



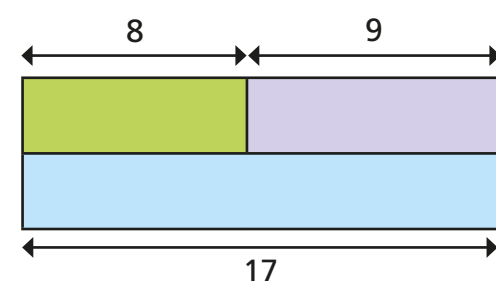
What other facts does it show?

$$3 + 5 = 8 \quad 8 = 3 + 5 \quad 8 = 5 + 3$$

$$8 - 5 = 3 \quad 3 = 8 - 5 \quad 5 = 8 - 3$$

2 Write the fact families for these bar models.

a)



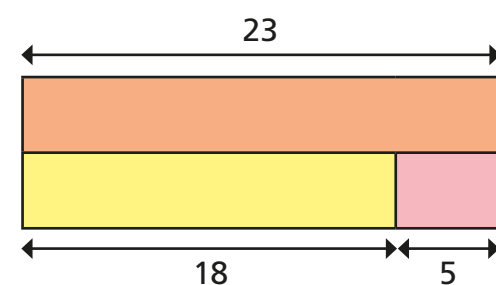
$$8 + 9 = 17 \quad 17 = 8 + 9$$

$$9 + 8 = 17 \quad 17 = 9 + 8$$

$$17 - 9 = 8 \quad 8 = 17 - 9$$

$$17 - 8 = 9 \quad 9 = 17 - 8$$

b)



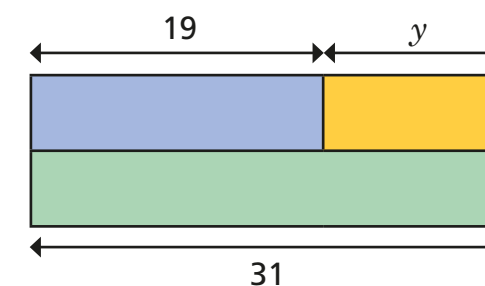
$$18 + 5 = 23 \quad 23 = 18 + 5$$

$$5 + 18 = 23 \quad 23 = 5 + 18$$

$$23 - 5 = 18 \quad 18 = 23 - 5$$

$$23 - 18 = 5 \quad 5 = 23 - 18$$

3 Annie is writing the fact family for this bar model.



She writes  $y = 19 + 31$

a) Explain why Annie is incorrect.

*31 is the total of 19 and y ( $19 + y = 31$ )*

b) Write the fact family for this bar model.

$$19 + y = 31$$

$$31 = 19 + y$$

$$y + 19 = 31$$

$$31 = y + 19$$

$$31 - y = 19$$

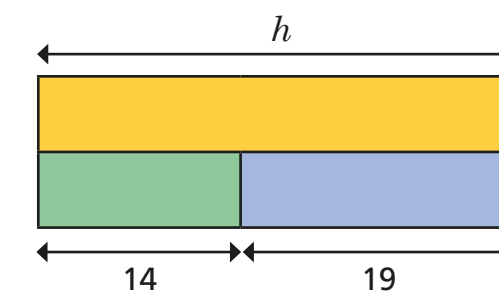
$$19 = 31 - y$$

$$31 - 19 = y$$

$$y = 31 - 19$$

4 Write the fact family for each bar model.

a)



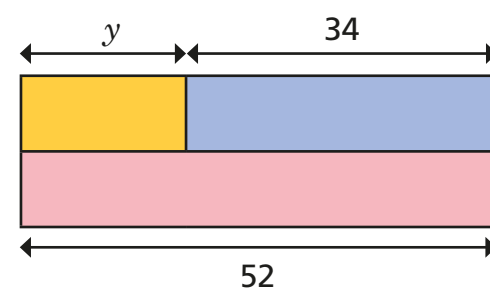
$$14 + 19 = h \quad h = 14 + 19$$

$$19 + 14 = h \quad h = 19 + 14$$

$$h - 19 = 14 \quad 14 = h - 19$$

$$h - 14 = 19 \quad 19 = h - 14$$

b)

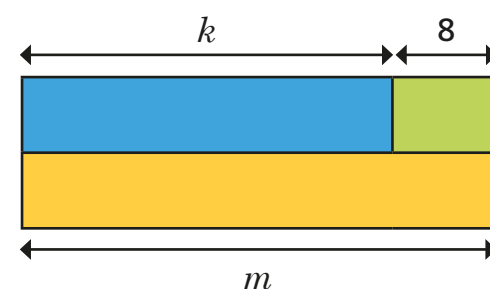


$$\begin{aligned} y + 34 &= 52 & 52 &= y + 34 \\ 34 + y &= 52 & 52 &= 34 + y \\ 52 - y &= 34 & 34 &= 52 - y \\ 52 - 34 &= y & y &= 52 - 34 \end{aligned}$$

5

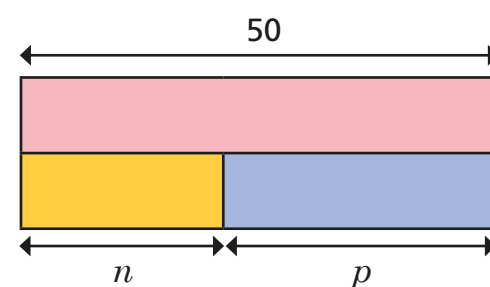
Write two addition facts and two subtraction facts for each bar model.

a)



$$\begin{aligned} k + 8 &= m \\ 8 + k &= m \\ m - k &= 8 \\ m - 8 &= k \end{aligned}$$

b)

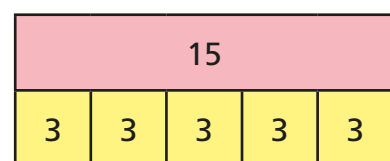


$$\begin{aligned} n + p &= 50 \\ p + n &= 50 \\ 50 - n &= p \\ 50 - p &= n \end{aligned}$$

6

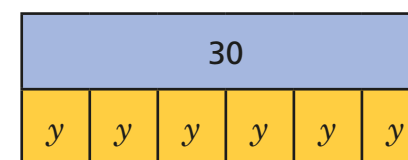
Use the bar models to complete the facts.

a)



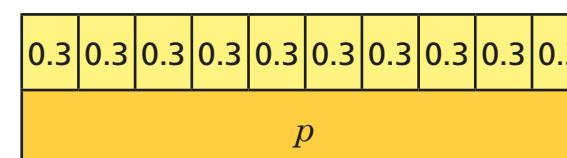
$$\begin{aligned} 15 &= 3 \times 5 \\ 15 &= 5 \times 3 \\ 15 \div 3 &= 5 \\ 15 \div 5 &= 3 \end{aligned}$$

b)



$$\begin{aligned} 30 &= 6 \times y \\ 30 &= y \times 6 \\ 30 \div y &= 6 \\ 30 \div 6 &= y \end{aligned}$$

c)



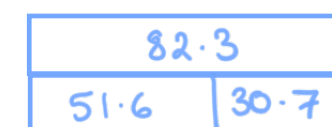
$$\begin{aligned} 0.3 \times 10 &= p \\ p \times 0.3 &= 10 \\ p \div 0.3 &= 10 \\ p \div 10 &= 0.3 \end{aligned}$$

7

Draw a bar model to represent each fact.

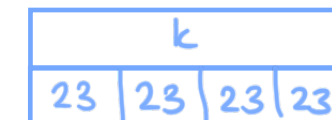
a)

$$51.6 = 82.3 - 30.7$$



c)

$$k = 23 \times 4$$



b)

$$g + 98 = 152$$



d)

$$\frac{108}{6} = w$$



What other related facts can you see from your bar models?