

Year 8 Algebra Starters

Starter 1 (1 of 3)

► Calculate: $-5 + 12 = \underline{\hspace{1cm}}$

► Collect **like terms**: $3x + 4x = \underline{\hspace{1cm}}$

► **Expand**: $3(x + 4) = \underline{\hspace{2cm}}$

Starter 1 (1 of 3)

► Calculate: $-5 + 12 = 7$

► Collect **like terms**: $3x + 4x = 7x$

► **Expand**: $3(x + 4) = 3x + 12$

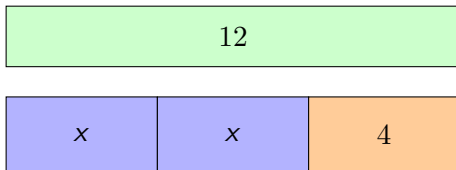
Starter 1 (2 of 3)

► Solve: $x + 6 = 14 \Rightarrow$ _____

مساوات

بارماڈل

► Write an **equation** represented by the **bar model** and solve it.



Starter 1 (2 of 3)

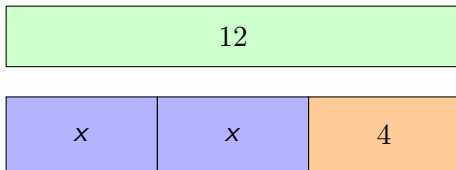
- ▶ Solve: $x + 6 = 14 \Rightarrow x = 8$

مساوات

بارماڈل

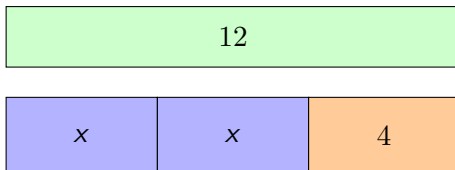
- ▶ Write an **equation** represented by the **bar model** and solve it.

$2x + 4 = 12$, so $x = 4$.



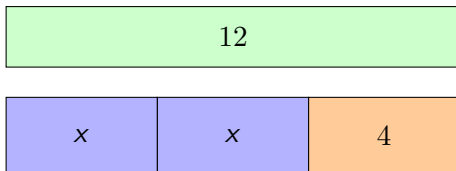
Starter 1 (3 of 3)

- ▶ If the total was 18 instead of 12, what would x be?
- ▶ Is $3(x + 4) = 3x + 4$ true or false? Explain.



Starter 1 (3 of 3)

- ▶ If the total was 18 instead of 12, what would x be $x = 7$.
- ▶ Is $3(x + 4) = 3x + 4$ true or false? Explain. False, because $3(x + 4) = 3x + 12$.



Starter 2 (1 of 3)

► Calculate: $6 - 11 = \underline{\hspace{2cm}}$

► Collect **like terms**: $5x + 2 + 3x = \underline{\hspace{2cm}}$

► **Expand**: $4(a + 2) = \underline{\hspace{2cm}}$

Starter 2 (1 of 3)

► Calculate: $6 - 11 = -5$

► Collect **like terms**: $5x + 2 + 3x = 8x + 2$

► **Expand**: $4(a + 2) = 4a + 8$

Starter 2 (2 of 3)

- ▶ Solve: $2x = 14 \Rightarrow$ _____

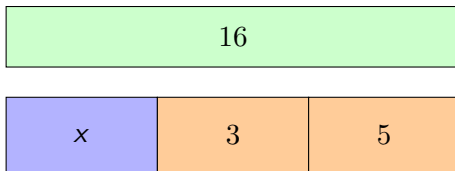
مساوات

بار ماڈل

- ▶ Write the **equation** represented by the **bar model** and solve it.

مستقل

- ▶ Which part of the diagram represents the **constant**?



Starter 2 (2 of 3)

- Solve: $2x = 14 \Rightarrow x = 7$

مساوات

بار ماڈل

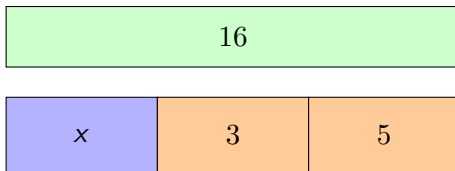
- Write the **equation** represented by the **bar model** and solve it.

$$x + 3 + 5 = 16, \text{ so } x = 8.$$

مستقل

- Which part of the diagram represents the **constant**? **The 3 and**

5 blocks (total 8).



Starter 2 (3 of 3)

▶ Create a **بارماڈل** bar model for $8x + 2 = 26$.

▶ Simplify: $ax + bx =$ _____

Starter 2 (3 of 3)

بارماڈل

- ▶ Create a **bar model** for $8x + 2 = 26$. **Eight x -blocks and a 2-block, with total 26.**
- ▶ Simplify: $ax + bx = (a + b)x$

Starter 3 (1 of 3)

► Calculate: $-3 + 8 = \underline{\quad}$

► Collect **like terms**: $6a + 3 + 2a = \underline{\hspace{2cm}}$

► **Expand**: $2(x + 7) = \underline{\hspace{2cm}}$

Starter 3 (1 of 3)

► Calculate: $-3 + 8 = 5$

► Collect *ہم جنس جملے* like terms: $6a + 3 + 2a = 8a + 3$

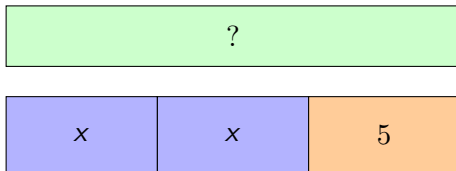
► *توسیع کریں* Expand: $2(x + 7) = 2x + 14$

Starter 3 (2 of 3)

► Solve: $x - 4 = 9 \Rightarrow$ _____

► Suppose the total is 17. Write and solve the *مساوات* equation.

► Suppose the total is 25. What is x now?



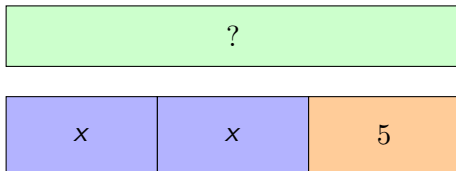
Starter 3 (2 of 3)

- ▶ Solve: $x - 4 = 9 \Rightarrow x = 13$

- ▶ Suppose the total is 17. Write and solve the *مساوات* equation.

$2x + 5 = 17$, so $x = 6$.

- ▶ Suppose the total is 25. What is x now $x = 10$.



Starter 3 (3 of 3)

توسیع کریں

► **Expand:** $3(x + 7) =$ _____

توسیع کریں

► **Expand:** $3(x - 7) =$ _____

Starter 3 (3 of 3)

توسیع کریں

► Expand: $3(x + 7) = 3x + 21$

توسیع کریں

► Expand: $3(x - 7) = 3x - 21$

Starter 4 (1 of 3)

► Calculate: $-6 \div 3 = \underline{\hspace{2cm}}$

► Collect **like terms**: $9a - 4a + 2 + 3b = \underline{\hspace{2cm}}$

► **Expand**: $5(y + 3) = \underline{\hspace{2cm}}$

Starter 4 (1 of 3)

► Calculate: $-6 \div 3 = -2$

► Collect **like terms**: $9a - 4a + 2 + 3b = 5a + 2 + 3b$

► **Expand**: $5(y + 3) = 5y + 15$

Starter 4 (2 of 3)

- Solve: $3d = 18 \Rightarrow$ _____

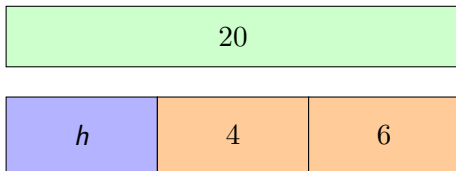
مساوات

- Write an **equation** represented by the diagram and solve for h .

- If the 4 block was instead h and the h block was 4, what

مساوات

equation would we have?



Starter 4 (2 of 3)

- Solve: $3d = 18 \Rightarrow d = 6$

مساوات

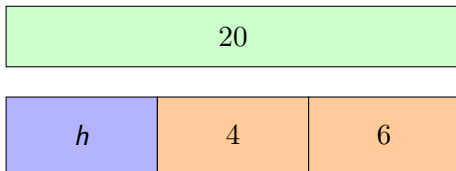
- Write an **equation** represented by the diagram and solve for h .

$$h + 4 + 6 = 20, \text{ so } h = 10.$$

- If the 4 block was instead h and the h block was 4, what

مساوات

equation would we have $4 + h + 6 = 20$.



Starter 4 (3 of 3)

توسیع کریں

► Expand: $(x - 3)(x - 2) = \underline{\hspace{2cm}}$

► Simplify: $a^2 \times a \times b = \underline{\hspace{2cm}}$

Starter 4 (3 of 3)

توسیع کریں

► Expand: $(x - 3)(x - 2) = x^2 - 5x + 6$

► Simplify: $a^2 \times a \times b = a^3b$

Starter 5 (1 of 3)

► Calculate: $7 - 12 = \underline{\hspace{2cm}}$

► Collect **like terms**: $2x + 7 + 3x = \underline{\hspace{2cm}}$

► **Expand**: $3(a + 5) = \underline{\hspace{2cm}}$

Starter 5 (1 of 3)

► Calculate: $7 - 12 = -5$

► Collect **like terms**: $2x + 7 + 3x = 5x + 7$

► **Expand**: $3(a + 5) = 3a + 15$

Starter 5 (2 of 3)

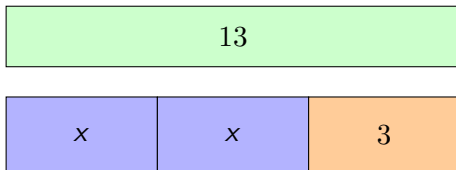
- ▶ Solve: $2x + 3 = 11 \Rightarrow$ _____

مساوات

- ▶ Write and solve the **equation** represented by the model.

مساوات

- ▶ Explain how each part of the diagram matches the **equation**.



Starter 5 (2 of 3)

- ▶ Solve: $2x + 3 = 11 \Rightarrow x = 4$

مساوات

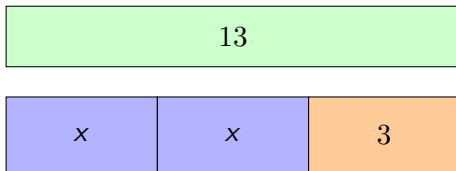
- ▶ Write and solve the equation represented by the model.

$$2x + 3 = 13, \text{ so } x = 5.$$

مساوات

- ▶ Explain how each part of the diagram matches the equation.

Two x -blocks and a 3-block make the total 13.



Starter 5 (3 of 3)

- ▶ Draw a **bar model** ^{بارماڈل} to represent $3x + 3 = 13$.
- ▶ Write an **equation** ^{مساوات} with **solution** ^{حل} $x = 5$.

Starter 5 (3 of 3)

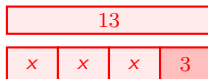
بارماڈل

- ▶ Draw a **bar model** to represent $3x + 3 = 13$.

مساوات

حل

- ▶ Write an **equation** with **solution** $x = 5$. e.g. $x + 2 = 7$.



$$3x + 3 = 13$$

Starter 6 (1 of 3)

► Calculate: $-4 \times 6 =$ _____

► Collect **like terms**: $7x + 3x - 5 =$ _____
ہم جنس جملے

► **Expand**: $2(3x + 4) =$ _____
توسیع کریں

Starter 6 (1 of 3)

► Calculate: $-4 \times 6 = -24$

► Collect *ہم جنس جملے* like terms: $7x + 3x - 5 = 10x - 5$

► *توسیع کریں* Expand: $2(3x + 4) = 6x + 8$

Starter 6 (2 of 3)

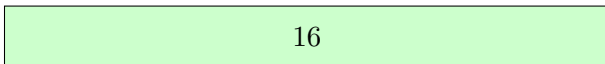
- ▶ Solve: $3x + 5 = 17 \Rightarrow$ _____
- ▶ Solve: $4x + 3 = 2x + 15 \Rightarrow$ _____
- ▶ Solve: $\frac{x}{3} + 4 = 9 \Rightarrow$ _____

Starter 6 (2 of 3)

- ▶ Solve: $3x + 5 = 17 \Rightarrow x = 4$
- ▶ Solve: $4x + 3 = 2x + 15 \Rightarrow x = 6$
- ▶ Solve: $\frac{x}{3} + 4 = 9 \Rightarrow x = 15$

Starter 6 (3 of 3)

- ▶ Write one ^{مساوات}equation that could be represented by this ^{بارماڈل}bar model.
- ▶ Write a different ^{مساوات}equation with the same ^{حل}solution.
- ▶ Create an ^{مساوات}equation with ^{حل}solution $x = 4$ that includes a ^{منفی رکن}negative term.



Starter 6 (3 of 3)

مساوات

- ▶ Write one **equation** that could be represented by this

بارماڈل

bar model. $3x + 4 = 16$.

مساوات

حل

- ▶ Write a different **equation** with the same **solution.** e.g.

$$2x + 3 = 11.$$

مساوات

حل

- ▶ Create an **equation** with **solution** $x = 4$ that includes a

منفی رکن

negative term. e.g. $2x - 3 = 5$.

