Algebra: expressions and equations

Free Extra Maths Class · Grade 7

Name: _____

Remember: To find x, undo the sum with the opposite operation (+ ↔ −, × ↔ ÷), and do it to both sides. **Why?** An equation is like a scale that hangs level. If you do the same thing to both sides, it stays level. Write each step on a new line.

1. Write as an algebraic expression: a number x multiplied by 6.

Answer: _____

2. If $x = 7$, work out $4x - 5$.

Answer: _____

3. Solve: $x + 13 = 31$

Answer: _____

4. Solve: $9x = 72$

Answer: _____

5. The scale is balanced. Each block weighs x kg and the weights show kg. Write an equation and find x.



Answer: _____

6. If $a = 3$ and $b = 5$, work out $5a + 2b$.

Answer: _____

7. Solve: $x \div 6 = 8$

Answer: _____

8. Solve: $2x - 7 = 15$

Answer: _____

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9. $y = 4x - 3$. (a) Find y when $x = 6$. (b) Find x when $y = 45$.

Answer: _____

10. Lebo has p sweets. She gets 8 more and then shares all her sweets equally with her brother. Write an expression for how many sweets each gets.

Answer: _____

11. I think of a number. I multiply it by 5 and subtract 6. I get 39. Write an equation and find the number.

Answer: _____

12. Solve by inspection: $30 - x = 12$

Answer: _____

13. Thabo buys 4 identical pens and a ruler for R7. He pays R39 altogether. One pen costs p. Write an equation and work out p.

Answer: _____

14. Sipho shares n marbles equally among 3 friends. Then Anna gives each friend 4 more. Now each friend has 11. Write an equation and find n.

Answer: _____

15. If $x = 4$: which is bigger, $3x^2$ or $(3x)^2$? By how much?

Answer: _____

I got _____ out of 15 ☆ ☆ ☆

Memo

Algebra: expressions and equations

Other correct methods are also right.

1. **$6x$**
   $6 \times x = 6x$ (we leave out the times sign)

2. **23**
   $4 \times 7 - 5 = 28 - 5 = 23$

3. **$x = 18$**
   $x = 31 - 13 = 18$. Check: $18 + 13 = 31$

4. **$x = 8$**
   Divide both sides by 9: $x = 72 \div 9 = 8$

5. **$3x + 4 = 19$; $x = 5$**
   Take 4 off both sides: $3x = 15$; divide by 3: $x = 5$

6. **25**
   $5 \times 3 + 2 \times 5 = 15 + 10 = 25$

7. **$x = 48$**
   Multiply both sides by 6: $x = 8 \times 6 = 48$

8. **$x = 11$**
   Add 7 to both sides: $2x = 22$; divide by 2: $x = 11$

9. **(a) $y = 21$ (b) $x = 12$**
   (a) $4 \times 6 - 3 = 21$ (b) $4x - 3 = 45$; $4x = 48$; $x = 12$

10. **$(p + 8) \div 2$**
    First $p + 8$; then divide by 2, so brackets: $(p + 8) \div 2$

11. **$5x - 6 = 39$; $x = 9$**
    $5x = 39 + 6 = 45$; $x = 45 \div 5 = 9$. Check: $5 \times 9 - 6 = 39$

12. **$x = 18$**
    30 minus which number gives 12? $30 - 12 = 18$, so $x = 18$

13. **$4p + 7 = 39$; $p = 8$ (one pen costs R8)**
    $4p = 39 - 7 = 32$; $p = 32 \div 4 = 8$

14. **$n \div 3 + 4 = 11$; $n = 21$**
    $n \div 3 = 11 - 4 = 7$; $n = 7 \times 3 = 21$

15. **$(3x)^2$, by 96**
    $3 \times 4^2 = 3 \times 16 = 48$; $(3 \times 4)^2 = 12^2 = 144$; $144 - 48 = 96$