

GCSE Maths: Identities and algebraic proof (Foundation): worksheet

GCSE Maths - Algebra Basics - Foundation - Lesson 7.9

Name: _____

Date: _____

Score: _____

12 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch07-algebra-basics/foundation/identities-and-algebraic-proof/

Exercise 7J Identities and proof Non-calculator

1 For each statement, say whether it is an equation or an identity. Give a reason.

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

Answer: _____

(b) $2x + 5 = 11$

Answer: _____

(c) $x^2 - 9 = (x - 3)(x + 3)$

Answer: _____

(d) $4x = x + 12$

Answer: _____

(e) $(x + 1)^2 = x^2 + 1$

Answer: _____

(f) $5x - 2x = 3x$

Answer: _____

2 Show that each identity is true.

(a) $2(x + 5) + 3 \equiv 2x + 13$

Answer: _____

(b) $4(x + 3) - 2(x + 1) \equiv 2x + 10$

Answer: _____

(c) $x(x + 3) - 3x \equiv x^2$

Answer: _____

(d) $3(2x - 1) - 6x \equiv -3$

Answer: _____

3 Show that the sum of any four consecutive even numbers is a multiple of 4.

Answer: _____

4 Show that the sum of any two even numbers is even.

Answer: _____

5 Show that the product of an odd number and an even number is always even.

Answer: _____

6 Chen says: "The sum of any two odd numbers is odd." Give a counter-example to show that Chen is wrong.

Answer:

7 Beth says: "Think of a number. Double it. Add 6. Halve the answer. Subtract the number you first thought of. The answer is always 3." Use algebra to show that Beth is right.

Answer:

8 Think of a number. Add 4. Multiply the answer by 3. Subtract 12. Divide by 3. Show that you always end up with the number you started with.

Answer:

9 n is an integer. Explain why $2n$ is always even and $2n + 1$ is always odd.

Answer:

10 Show that $(x + 3)^2 - 9 \equiv x(x + 6)$.

Answer:

11 Mia says that $(x + 2)^2 \equiv x^2 + 4$ for all values of x . Is Mia right? Explain.

Answer:

12 Show that the sum of an odd number and an even number is always odd.

Answer: