

Algebra 2 · Structure of Expressions and Modeling with Equations · Quiz

Common Core A-SSE.A.1, A-SSE.A.2, A-CED.A.1, A-CED.A.2, A-CED.A.3, A-CED.A.4, A-REI.D.11, A-APR.C.5, N-CN.C.8, N-CN.C.9 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check interpreting expressions, factoring with structure, the Binomial Theorem, rearranging formulas, graphical solutions and modeling. Exactly one option is correct in each question, and the explanation points out the usual mistake.

Algebra 2 Common Core: A-SSE.A.1 · A-SSE.A.2 · A-CED.A.1 · A-CED.A.2 · A-CED.A.3 · A-CED.A.4 · A-REI.D.11 · A-APR.C.5 · N-CN.C.8 · N-CN.C.9

Questions

Question 1

In the model $P(t) = 250(1.08)^t$, what does the factor 1.08 tell you?

- A. The population is multiplied by 1.08 each period, an 8% increase
- B. The population grows by exactly 1.08 each period
- C. The starting population is 1.08
- D. The population decreases by 8% each period

Question 2

Factor $x^4 - 1$ completely over the real numbers.

- A. $(x^2 + 1)(x^2 - 1)$
- B. $(x + 1)^2(x - 1)^2$
- C. $(x^2 + 1)(x + 1)(x - 1)$
- D. $(x - 1)^4$

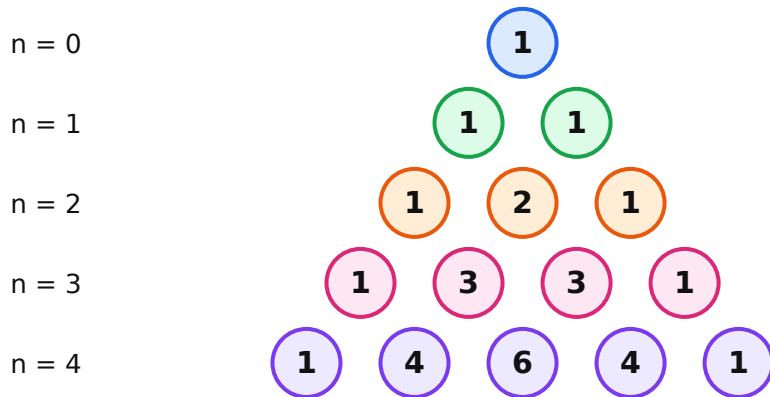
Question 3

Factor $x^2 + 36$ over the complex numbers.

- A. $(x + 6)(x - 6)$
- B. $(x + 6i)(x - 6i)$
- C. $(x + 6i)^2$
- D. $(x + 36i)(x - i)$

Question 4

Use the first rows of Pascal's triangle to find the coefficient of x^2y^3 in $(x+y)^5$.



- A. 10
- B. 5
- C. 15
- D. 6

Question 5

Which expression equals $(x+2)^3$?

- A. x^3+8
- B. x^3+2x^2+4x+8
- C. x^3+3x^2+6x+8
- D. $x^3+6x^2+12x+8$

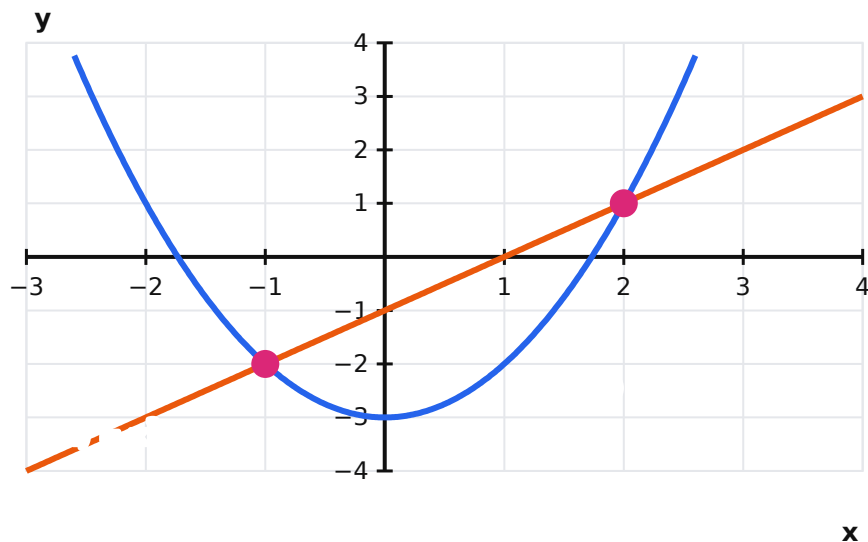
Question 6

Solve $V = \frac{1}{3}Bh$ for h .

- A. $h = \frac{V}{3B}$
- B. $h = \frac{3V}{B}$
- C. $h = 3VB$
- D. $h = \frac{B}{3V}$

Question 7

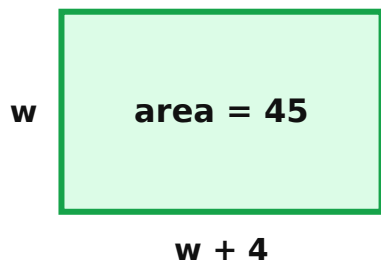
The graphs of $f(x) = x^2 - 3$ and $g(x) = x - 1$ are shown. What are the solutions of $f(x) = g(x)$?



- A. $x = -2$ and $x = 1$
- B. $y = -2$ and $y = 1$
- C. $x = -1$ and $x = 2$
- D. $x = -1$ only

Question 8

A rectangle is 4 feet longer than it is wide, and its area is 45 square feet. Which equation finds the width w ?



- A. $w + (w + 4) = 45$
- B. $w(w + 4) = 45$
- C. $2w + 2(w + 4) = 45$
- D. $w^2 + 4 = 45$

Question 9

Mei has . Ingredients cost plus .75 per batch of cookies. What is the greatest whole number of batches she can make?

- A. 22
- B. 28
- C. 21
- D. 38

Question 10

What are the solutions of $x^2 - 6x + 13 = 0$?

- A. $x = 3 \pm 4i$
- B. $x = -3 \pm 2i$
- C. $x = 3 \pm 2$
- D. $x = 3 \pm 2i$

Answer key

1. **A** - Multiplying by 1.08 is the same as adding 8% of the current amount. Adding 1.08 would be linear growth, not exponential.
2. **C** - $x^4 - 1 = (x^2 + 1)(x^2 - 1)$, and $x^2 - 1$ factors again. The factor $x^2 + 1$ has no real factors.
3. **B** - Since $(6i)^2 = -36$, $(x + 6i)(x - 6i) = x^2 + 36$. The factors $(x + 6)(x - 6)$ give $x^2 - 36$ instead.
4. **A** - Row 5 is 1, 5, 10, 10, 5, 1, built by adding neighbors in row 4 ($4 + 6 = 10$). Picking from row 4 gives 4 or 6, which are the wrong row.
5. **D** - Row 3 of Pascal's triangle is 1, 3, 3, 1, so the terms are $x^3 + 3(2)x^2 + 3(4)x + 8$. Writing only $x^3 + 8$ forgets the middle terms.
6. **B** - Multiply both sides by 3, then divide by B . Dividing by 3 instead of multiplying is the common slip.
7. **C** - Solutions are the x -coordinates of the crossing points $(-1, -2)$ and $(2, 1)$. The y -coordinates are outputs, not solutions of the equation.
8. **B** - Area is width times length, so $w(w + 4) = 45$, which gives $w = 5$. Adding the sides computes a perimeter-like quantity instead.
9. **C** - $12 + 1.75n \leq 50$ gives $n \leq 21.7$, so 21 batches. Dividing 50 by 1.75 ignores the fixed cost and gives 28.
10. **D** - The discriminant is $36 - 52 = -16$, so $x = \frac{6 \pm 4i}{2} = 3 \pm 2i$. Forgetting to divide the $4i$ by 2 gives the wrong imaginary part.

Remember:

- Standards A-SSE.A.1, A-SSE.A.2, A-CED.A.1-4, A-REI.D.11, A-APR.C.5 and N-CN.C.8-9 on expressions and modeling.
- A difference of squares can hide inside higher powers: $x^4 - y^4 = (x^2 + y^2)(x + y)(x - y)$.
- The solutions of $f(x) = g(x)$ are the x -coordinates where the two graphs cross.
- Row n of Pascal's triangle gives the coefficients of $(a + b)^n$.
- Over the complex numbers, $x^2 + 4 = (x + 2i)(x - 2i)$, and every quadratic has exactly two zeros.