

Structure, Identities and Modeling with Equations

Grade 11 – Algebra 2 math · Test · Standards: 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

Name: _____ Date: _____ Class: _____

This 45-minute test covers factoring with structure, formula rearranging, the Binomial Theorem, complex factoring, intersections of graphs and modeling equations. A calculator is allowed. Show your work.

Standards: 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 · **Level:** Grade 11 Algebra 2

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Factor completely (2 points)

Write $x^4 - 256$ as a product of as many real factors as possible.

Question 2 Rearrange formulas (2 points)

- Solve $C = (5/9)(F - 32)$ for F . (1 point)
- Solve $v^2 = u^2 + 2as$ for a . (1 point)

Question 3 Binomial expansion (3 points)

Use Pascal's triangle to expand $(x - 2)^4$.

n = 0					1
n = 1				1	1
n = 2			1	2	1
n = 3		1	3	3	1
n = 4	1	4	6	4	1

Pascal's triangle for Question 3.

Question 4 Complex factoring (2 points)

- Factor $x^2 + 49$ over the complex numbers. (1 point)

b. Find the zeros of $x^2 - 6x + 25$. (1 point)

Question 5 Intersection of two graphs (3 points)

The graph shows $f(x) = x^2 - 4$ (solid) and $g(x) = x + 2$ (dashed).

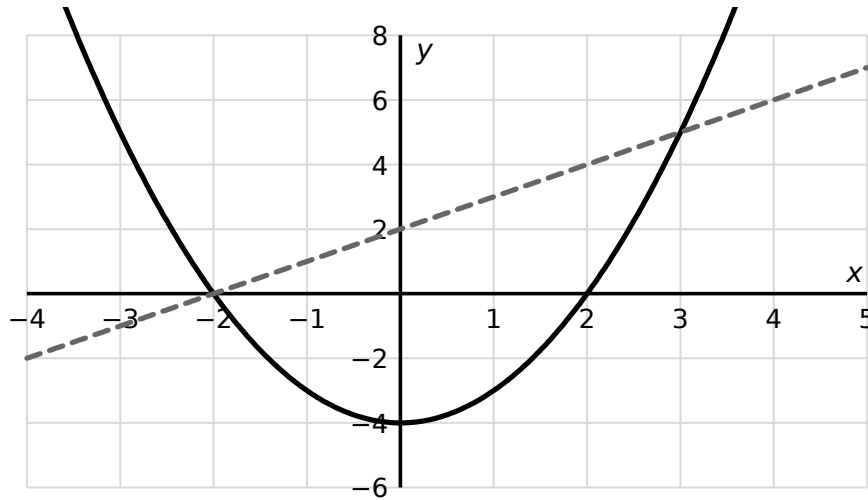


Figure for Question 5.

- a. Estimate the x-coordinates where $f(x) = g(x)$. (1 point)
- b. Solve $f(x) = g(x)$ algebraically. (2 points)

Question 6 Scooter depreciation (3 points)

A scooter bought for \$1,800 loses 15% of its value each year.

- a. Write a function $V(t)$ for its value after t years. (1 point)
- b. Find the value after 3 years. (1 point)
- c. When is it worth \$900, to the nearest tenth of a year? (1 point)

Question 7 Ticket system (2 points)

A concert sold 120 tickets for \$780. Adult tickets cost \$9 and child tickets cost \$5. How many of each were sold?

Question 8 Pen with a minimum area (2 points)

A rectangular pen is built with 40 feet of fencing and must enclose at least 91 square feet. If the width is w , write an inequality and find the possible widths.

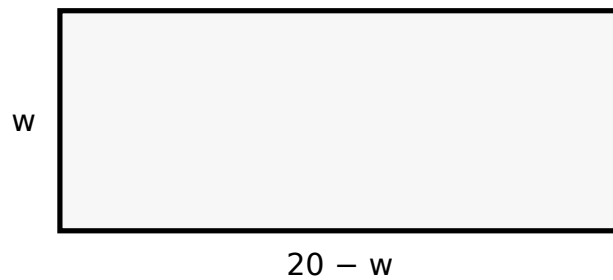


Figure for Question 8.

Question 9 Check an identity (1 point)

Verify $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ for $x = 5$ and $y = 2$.