

Interpreting and Comparing Functions in Context

Grade 11 – Algebra 2 math · Test · Standards: F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.8a, F-IF.C.9

Name: _____ Date: _____ Class: _____

This 45-minute test covers domain in context, average rate of change, vertex and factored forms, asymptotes, and comparing functions. A calculator is allowed. Show every step.

Standards: F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.8a, F-IF.C.9 · **Level:** Grade 11 Algebra 2

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

Question 1 Rectangle area model (3 points)

A rectangular pen is built with 30 feet of fencing, so its area is $A(w) = w(15 - w)$ for width w .

- State a reasonable domain. (1 point)
- Write $A(w)$ in vertex form. (1 point)
- State the maximum area and the width that gives it. (1 point)

Question 2 Average rate of change (2 points)

On the stretch from $x = 1$ to $x = 3$, how fast does $k(x) = x^4 - 3x$ change, on average?

Question 3 Rates from a table (2 points)

A drone's distance traveled is shown in the table.

Seconds	0	2	4	6
Distance (ft)	0	18	50	96

Table for Question 3.

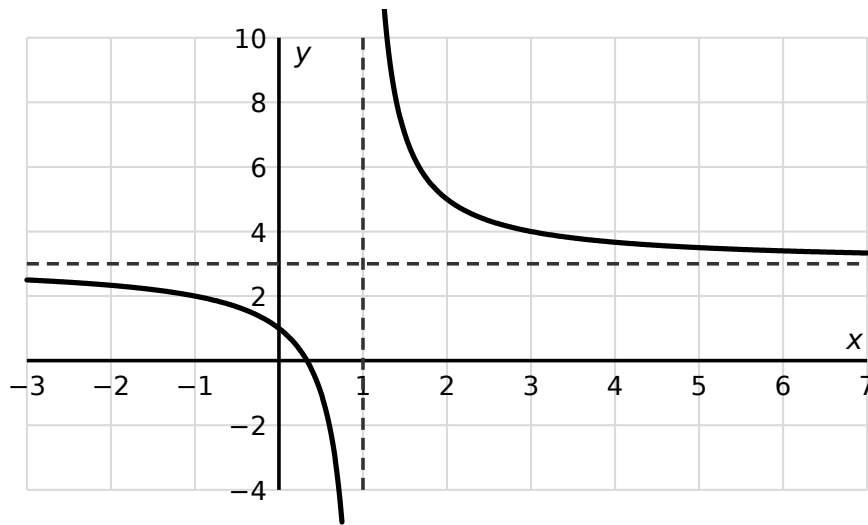
Find the average speed over each 2-second interval after the start and describe the trend.

Question 4 Zeros by completing the square (2 points)

Complete the square to solve $x^2 - 8x + 7 = 0$ and give the vertex of $y = x^2 - 8x + 7$.

Question 5 Features of a rational graph (3 points)

The graph shows $f(x) = 2/(x - 1) + 3$.



Graph for Question 5.

- State the domain. (1 point)
- Give the vertical asymptote. (1 point)
- Give the horizontal asymptote. (1 point)

Question 6 Compare a line and an exponential (3 points)

Function A is $A(x) = 3x + 10$. Function B is given by $B(0) = 4$, $B(1) = 8$, $B(2) = 16$, $B(3) = 32$.

- Find the average rate of change of each from 0 to 3. (1 point)
- Find $A(5)$ and $B(5)$, assuming B keeps doubling. (1 point)
- Which is larger for large x , and why? (1 point)

Question 7 Trig model features (2 points)

A model is $f(t) = 5 \sin(\pi t/4) + 20$. Find the period, the maximum value and the minimum value.

Question 8 Value of a device (2 points)

A tablet's value is $V(t) = 1200(0.9)^t$ dollars after t years. Find the average rate of change from $t = 0$ to $t = 2$ and interpret it.

Question 9 Domain of a logarithm (1 point)

State the domain of $f(x) = \log(x - 4)$.