

1. Graph $f_1(x) = x^2 - 4x - 5$ and find both zeros.

menu > Analyze Graph > Zero, twice

Answer: $x = 5$ and -1

2. Same parabola: find the minimum.

Analyze Graph > Minimum

Answer: $(2, -9)$

3. Graph $f_1(x) = -x^2 + 6x$. Find the maximum.

Analyze Graph > Maximum

Answer: $(3, 9)$

4. How do the zeros of $f_1(x) = x^2 - 4x - 5$ relate to its axis of symmetry?

Zeros 5 and -1 ; midpoint

Answer: axis $x = 2$ (midway)

5. Graph $f_1(x) = x^2 - 6x + 5$. Read the vertex from Minimum.

Analyze > Minimum

Answer: $(3, -4)$

6. $h(t) = -16t^2 + 80t$: graph and find the maximum. (Trainer echo!)

Window for $t \geq 0$

Analyze > Maximum

Answer: $(2.5, 100)$

7. Verify your factoring: does $x^2 - x - 12 = (x - 4)(x + 3)$? Graph both.

Identical curves

Answer: yes - equivalent

8. Graph $f_1(x) = x^2 - 3$ and $f_2(x) = 2x$. Find both intersections. (Linear-quadratic!)

Analyze > Intersection twice

Answer: $(3,6)$ and $(-1,-2)$

9. A quadratic model $f_1(x) = -0.5x^2 + 4x + 10$. Find its max height, the two zeros, and explain what each means.

Max via Maximum; zeros via Zero

Max = peak; positive zero = landing

Answer: max $(4,18)$; zeros approx 10.24 & -2.24

10. $f_1(x) = x^2 + bx + 9$ is a perfect square (touches the x-axis once). Use graphing to find a b that works, then explain.

Try $b = 6$: $(x+3)^2$ touches at $x = -3$

Or $b = -6$ at $x = 3$

Answer: $b = 6$ (zero -3) or $b = -6$ (zero 3)