

1. $h(t) = -16t^2 + 64t$. Time at max height?

$$t = -b/2a = 64/32$$

Answer: $t = 2$ s

2. Same: max height?

$$h(2) = -64 + 128$$

Answer: 64 ft

3. Same: when does it land ($h = 0$)?

$$-16t(t - 4) = 0$$

Answer: $t = 4$ s

4. A garden area $A(x) = x(20 - x)$. What x gives the max area?

Zeros 0 and 20; vertex midway

Answer: $x = 10$

5. Same garden: what is the max area?

$$A(10) = 10 \times 10$$

Answer: 100 sq units

6. Revenue $R(p) = p(100 - p)$. Price for max revenue?

Vertex midway between 0 and 100

Answer: $p = 50$

7. $h(t) = -16t^2 + 48t + 4$. Starting height?

$$h(0)$$

Answer: 4 ft

8. A ball: $h(t) = -16t^2 + 32t + 48$. When does it hit the ground?

$$-16(t^2 - 2t - 3) = 0$$

$$(t-3)(t+1)$$

Answer: $t = 3$ s

9. A rectangular pen against a wall uses 40 ft of fence on 3 sides: $A(x) = x(40 - 2x)$. Find x for max area and

Zeros 0, 20; vertex $x = 10$

$$A(10) = 10 \times 20$$

Answer: $x = 10$ ft; max area 200 sq ft

10. A projectile $h(t) = -16t^2 + 80t + 6$ (from Jan 2026 trainer style). Find the max height and total air time (n

$$t = 80/32 = 2.5; h(2.5) = 106$$

Ground: solve $-16t^2 + 80t + 6 = 0$

Answer: max 106 ft at 2.5 s; lands ~5.07 s