

Name _____



1. Emily is designing a circular garden. If the area of the garden is given by the quadratic equation $A(r) = 3r^2 + 12r + 10$ square meters, where r is the radius in meters, what is the radius of the garden?
2. Jack is launching a model rocket. If the height h (in meters) of the rocket above the ground at time t seconds is given by the quadratic equation $h(t) = -5t^2 + 20t + 15$, when does the rocket reach its maximum height?
3. Mia is selling tickets to a concert. If she charges \$10 per ticket and sells x tickets, but also offers a \$5 discount for buying more than 8 tickets, how many tickets did she sell if she earned \$200?
4. Ethan is a diver jumping into a pool. If the height h (in meters) of the dive at time t seconds after jumping is given by the quadratic equation $h(t) = -4t^2 + 16t + 8$, what's the maximum height of the dive?
5. Sophia is throwing a stone into a pond. If the height h (in meters) of the stone above the water surface at time t seconds is given by $h(t) = -3t^2 + 12t - 6$, when does the stone hit the water?
6. Lucas is shooting a basketball. If the height h (in meters) of the basketball above the ground at time t seconds after being shot is given by $h(t) = -2t^2 + 8t + 5$, when does the basketball hit the ground?
7. Olivia is a biologist studying the growth of bacteria in a petri dish. If the number of bacteria n in the dish after t hours is given by the quadratic equation $n(t) = 2t^2 + 10t + 15$, when does the number of bacteria reach its maximum?
8. Daniel is a farmer planting crops in a rectangular field. If the area A (in square meters) of the field after t days of planting is given by the quadratic equation $A(t) = -3t^2 + 18t + 20$, how many days does it take for the field to reach its maximum area?
9. Sarah is a scientist studying the motion of a pendulum. If the angle θ (in degrees) of the pendulum at time t seconds after being released is given by $\theta(t) = -1/2t^2 + 6t + 10$, when does the pendulum reach its maximum angle?
10. Noah is an engineer designing a roller coaster. If the height h (in meters) of a loop-the-loop at a distance x meters from the center is given by $h(x) = -2x^2 + 16x - 4$, how far from the center is the highest point of the loop-the-loop?

