

Section 4.2 Practice Master

1. The table gives the approximate height of a cannonball for a 6-s flight.

Time, t (s)	Height, h (m)
0	0
1	25
2	40
3	45
4	40
5	25
6	0

- Sketch a graph of the quadratic relation.
 - Describe the flight path of the cannonball.
 - Identify the axis of symmetry and the vertex.
 - What is the maximum height that the cannonball reached?
 - Verify that $h = -5t^2 + 30t$ can be used to model the flight path of the cannonball.
2. Use finite differences to determine whether each relation is linear, quadratic, or neither.

a)

x	y
0	3
1	6
2	9
3	12
4	15

b)

x	y
-4	5
-2	10
0	20
2	30
4	40

c)

x	y
1	1
3	9
5	25
7	49
9	81

d)

x	y
-5	-125
-3	-27
-1	-1
1	1
3	27

3. A girl is skipping rope when a picture is taken of her. At the instant the picture is taken, her hands are 1 m apart and the centre of the rope is directly above her head, 2 m above her hands.

- Use this information to graph the relation modelling the shape of the rope. The positions of her hands are the x -intercepts, and the centre of the rope is the y -intercept.
- Describe the shape of the arch that the rope makes.

4. A ball is thrown upward with an initial velocity of 10 m/s. Its approximate height, h , in metres, above the ground after t seconds is given by the relation $h = -5t^2 + 10t + 35$.

- Sketch a graph of the quadratic relation.
- Describe the flight path of the ball.
- Find the maximum height of the ball.
- How long does it take the ball to reach this maximum height?

5. The table shows the height of a ball as it moves, where x represents the distance along the ground and h represents the height above the ground, in metres.

Distance (m)	Height (m)
0	12
1	14
2	14
3	12
4	8
5	2

- Sketch a graph of the quadratic relation.
- Describe the flight path of the ball.
- Identify the axis of symmetry, and explain why it is the axis of symmetry.
- Identify the vertex.
- What is the maximum height of the ball?
- Verify that $h = -x^2 + 3x + 12$ can be used to model the flight path of the ball.