

Investigation 4 Additional Practice

1. a. $D = -4(10)^2 + 12(10) = -280$ feet, or 280 feet deep
b. $D = -4(8.5)^2 + 12(8.5) = -187$ feet, or 187 feet deep
c. It will take 6 seconds because $D = -4(6)^2 + 12(6) = -72$ feet, or 72 feet deep
2. a. $C = 2(4)^2 + 9(4) + 100 = \168
b. $C = 2(10)^2 + 9(10) + 100 = \390
c. i. $(\$168) \div 4 = \42
ii. $(\$390) \div 10 = \39
iii. The cost per container is lower when 10 containers are made than when 4 containers are made.
d. 40; Students may use a graph or a table to find their answers. To use a table enter the equation $y = 2(x)^2 + 9x + 100$ into the calculator and find the x (or n) value when the y (or C) value is 3,600. The equation can also be used. However, this is not something that students have done before: solving an equation for x such that $3,600 = 2(x)^2 + 9x + 100$. Students may guess and check finding that $x = 40$ works.

3. a.

x	0	1	2	3	4
y	0	5	20	45	80

- b. The first differences are +5, +15, +25 and +35.
c. The second differences are all 10.
d. The second differences are all the same since $y = 5x^2$ is a quadratic relationship.

4. a.

x	0	1	2	3	4
y	0	8	32	72	128

- b. The first differences are +8, +24, +40, and +56
c. The second differences are all 16.
d. The second differences are all the same since $y = 8x^2$ is a quadratic relationship.