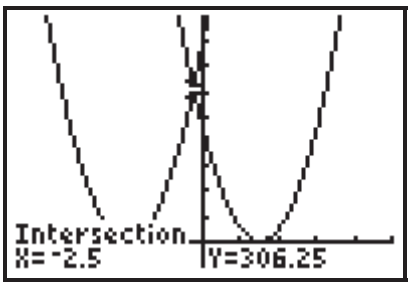
In $3n^2 + 12n - m + 6 = 0$

Left Side
$3n^2 + 12n - m + 6$
$= 3(-1.18)^2 + 12(-1.18) - (-3.98) + 6$
$= -0.0028$
≈ 0

Right Side
0

Left Side = Right Side

e)
$0 = t^2 + 40t - h + 400$
$t^2 = h + 30t - 225$
From the graph, the solution is $(-2.5, 306.25)$.



For $(-2.5, 306.25)$:
In $0 = t^2 + 40t - h + 400$

Left Side
0

Right Side
$t^2 + 40t - h + 400$
$= (-2.5)^2 + 40(-2.5) - 306.25 + 400$
$= 0$

Left Side = Right Side

In $t^2 = h + 30t - 225$

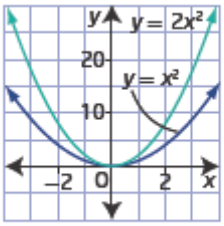
Left Side
t^2
$= (-2.5)^2$
$= 6.25$

Right Side
$h + 30t - 225$
$= 306.25 + 30(-2.5) - 225$
$= 6.25$

Left Side = Right Side

Section 8.1 Page 436 Question 6

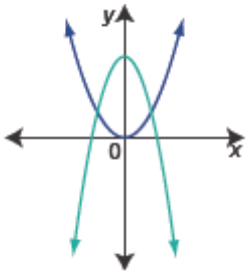
The two parabolas have the same vertex, but different a values.
Example: $y = x^2$ and $y = 2x^2$.



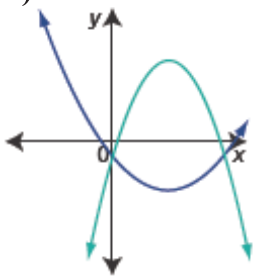
Section 8.1 Page 436 Question 7

Examples:

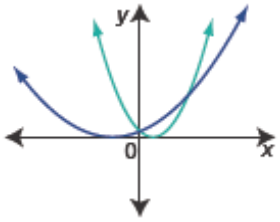
a)



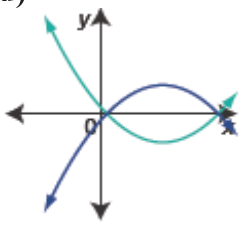
b)



c)



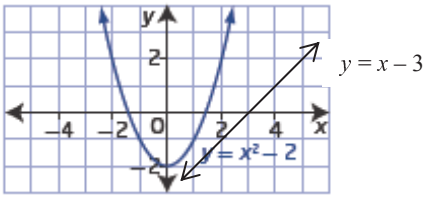
d)



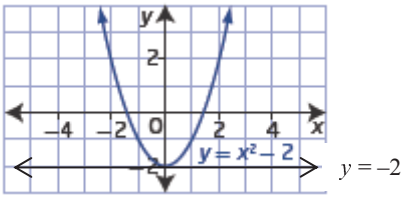
Section 8.1 Page 436 Question 8

Examples:

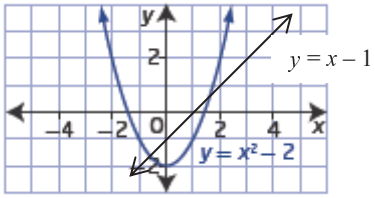
a) $y = x - 3$



b) $y = -2$



c) $y = x - 1$



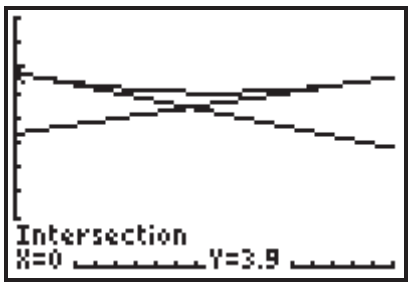
Section 8.1 Page 436 Question 9

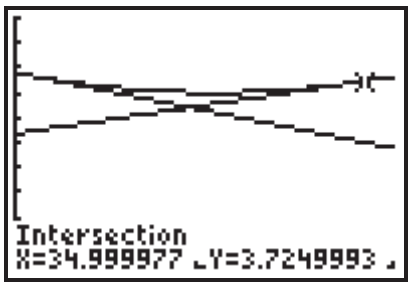
a) The points of intersection on the graph are (100, 3800) and (1000, 8000), to the nearest hundred.

b) When he makes and sells either 100 or 1000 shirts, Jonas makes no profit as costs equal revenue. When he makes more than 100 shirts but less than 1000 he will make a profit.

c) Estimate when the vertical distance between the Cost line and the Revenue parabola is greatest: this is the greatest profit. From the graph it is about 550 shirts, which gives a profit of about $15 500.

Section 8.1 Page 436 Question 10



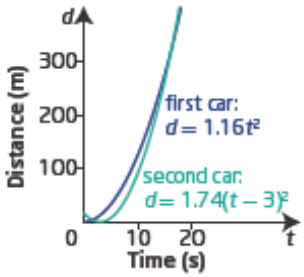


The coordinates of the beginning of the curve are (0, 3.9). The coordinates of the end of the curve are (35, 3.725).

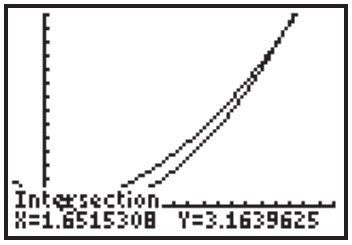
Section 8.1 Page 437 Question 11

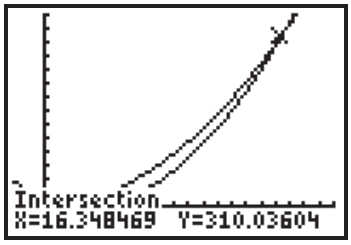
a) The system of equations that represents the distance travelled by the two cars is: $d = 1.16t^2$ and $d = 1.74(t - 3)^2$.

b) Since the first car accelerates for 20 s, and the next car starts 3 s later, a suitable domain for consideration is $0 \leq t \leq 23$.



c)



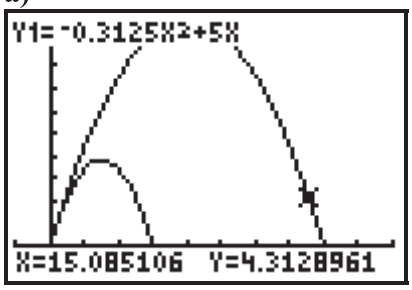


Graphically the two solutions are (1.65, 3.16) and (16.35, 310.04). However, the first is not a solution for the distance between the cars during the test, because at $t = 1.65$ the second car has not yet started.

d) The solution (16.35, 310.04) means that at 16.35 s after the first car starts, both cars have travelled the same distance, about 310.04 m.

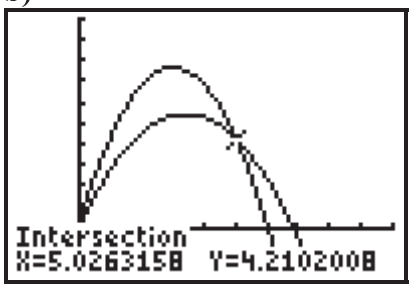
Section 8.1 Page 437 Question 12

a)



Both streams of water start at (0, 0), at the fountain, but they have no other point in common. The tallest stream reaches higher and further from the fountain than the smaller stream.

b)

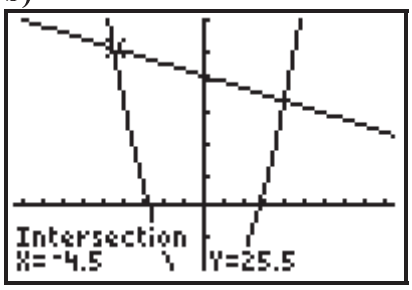


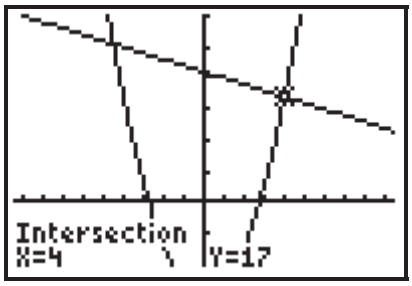
Both streams of water start at (0, 0), but the second stream passes through the other fountain's spray 5.03 m from the fountain, at a height of 4.21 m.

Section 8.1 Page 437 Question 13

a) Let x represent the smaller integer and y the larger integer.
$x + y = 21$
$2x^2 - 15 = y$

b)





One point of intersection does not give integers. The two integers are 4 and 17.

c) For $x + y = 21$:

Left Side	Right Side
$x + y$	21
$= 4 + 17$	
$= 21$	

Left Side = Right Side

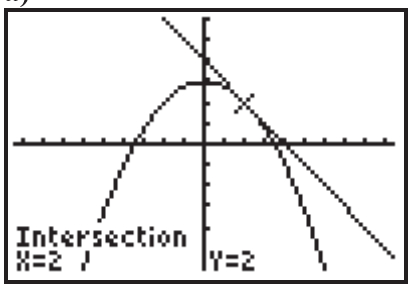
For $2x^2 - 15 = y$

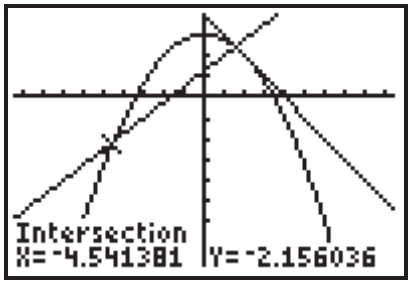
Left Side	Right Side
$2x^2 - 15$	y
$= 2(4)^2 - 15$	$= 17$
$= 17$	

Left Side = Right Side

Section 8.1 Page 438 Question 14

a)





The blue line and parabola intersect at (2, 2). The green line and the parabola intersect at about (−4.54, −2.16).

b) When a snowboarder leaves the jump at a point (2, 2), he lands at a point with the relative location (−4.54, −2.16).