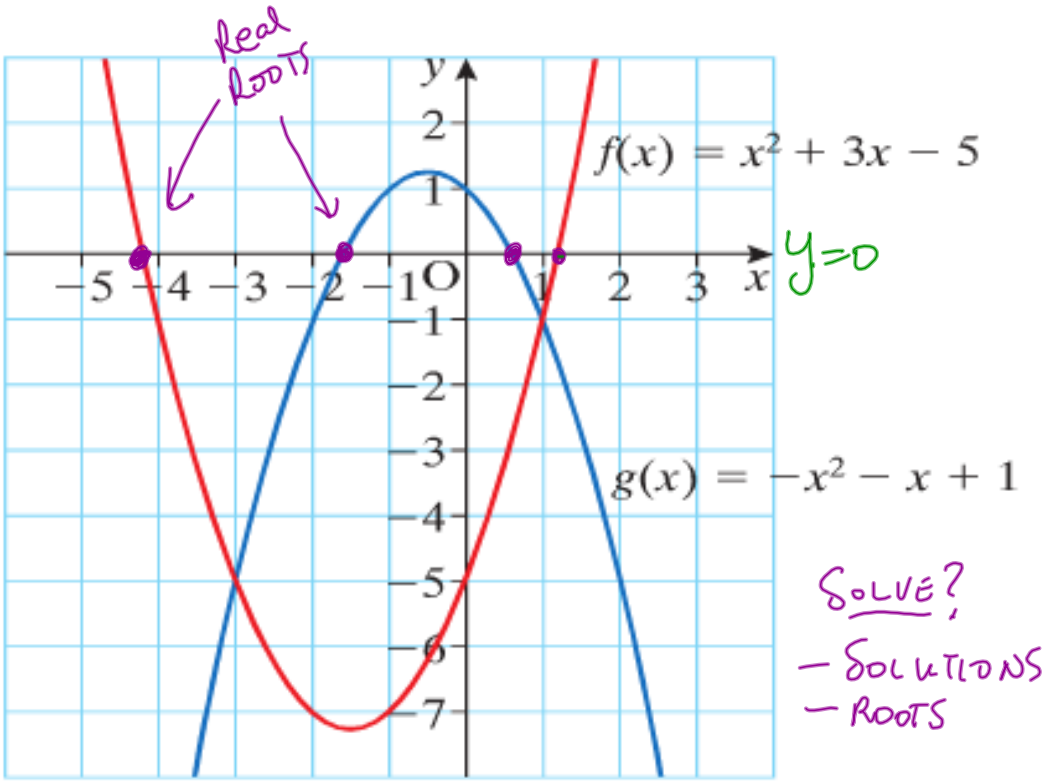
Algebra 2

Quadratic Roots

Section 2.2



THIS CURVE HAS NO REAL ROOTS

$$f(x) = x^2 + 3x + 3 = 0$$

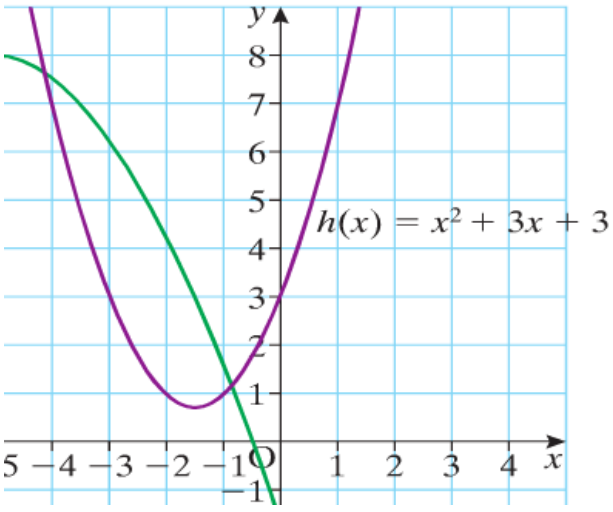
$a = 1$
$b = 3$
$c = 3$

$$\Rightarrow x = \frac{-3 \pm \sqrt{3^2 - 4(1)(3)}}{2(1)}$$

$$= \frac{-3 \pm \sqrt{9 - 12}}{2}$$

$$= \frac{-3 \pm \sqrt{-3}}{2}$$

← THIS IS NOT A REAL NUMBER



In this graph we see that the curve $h(x) = x^2 + 3x + 3$ does not cross X-axis.

$\Rightarrow$ no Real Roots

The discriminant helps us know the type of roots a quadratic function has

$b^2 - 4ac$ = "discriminant"

$b^2 - 4ac > 0 \Rightarrow$ 2 Real Roots

$b^2 - 4ac < 0 \Rightarrow$ no Real

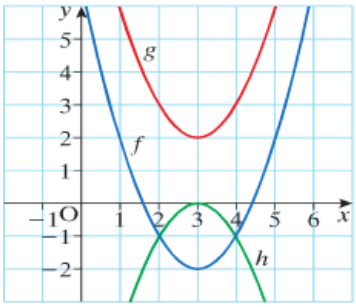
$b^2 - 4ac = 0 \Rightarrow$ 1 Real Root

Homework P-55

Exercise 2.2

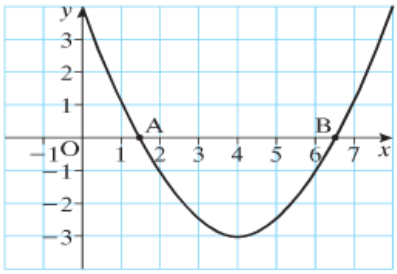
1. By inspection, state which of the curves – f, g and h – have

(i) real and distinct roots
(ii) real and equal roots
(iii) imaginary roots.
(iv) In the case of real roots, estimate from the graph the roots of each equation.



2. The curve shown has equation of the form $ax^2 + bx + c = 0$.

Find, in terms of a, b, and c, the coordinates of the points A and B.



3. Find the discriminant of each of the following equations and state if the roots are

(a) real and different (b) real and equal (c) imaginary.

(i) $2x^2 + x + 5 = 0$ (ii) $-2x^2 + 3x + 1 = 0$ (iii) $3x^2 + 2x - 1 = 0$

(iv) $-3 + 2x - x^2 = 0$ (v) $x^2 + 8x + 16 = 0$ (vi) $25 - 10x + x^2 = 0$