

The Discriminant

1. Determine the value of the discriminant and then state the nature of the roots for each of the following.

a) $x^2 - 2x - 4$

b) $3x^2 - 5x + 3$

c) $x^2 - 9x + 7$

d) $2x^2 - x + 3$

e) $x^2 - 8x + 16$

f) $\sqrt{3}x^2 - 4\sqrt{2}x - \sqrt{3}$

g) $9x^2 - 6x + 1$

h) $\frac{1}{4}x^2 + \frac{3}{2}x + \frac{5}{4}$

2. Find a value of k so that the quadratic:

a) $x^2 + kx + 7 = 0$ has one root (two roots that are the same)

b) $kx^2 + 3x + 1 = 0$ has no roots

c) $-x^2 + 4x + k = 0$ has two different roots

d) $x^2 - kx + 5 = 0$ has no roots

e) $kx^2 + 6x + 3k = 0$ has two different roots