7 Find to two decimal places the positive root of the equation \( x^3 - 2x - 5 = 0 \).

8 Given the equation
\[
x^n + c_1 x^{n-1} + c_2 x^{n-2} + \ldots + c_n = 0
\]
(a) What is the sum of the roots?
(b) What is the product of the roots?
(c) Express \( c_2 \) in terms of the roots.

9 One of the roots of the equation
\[
x^3 - 2x^2 + 8x - 3 = 0
\]
is \( 1 - \sqrt{2} \).
Find the other roots.

10 In how many ways can a detail of 2 officers and 5 men be chosen from a group of 10 officers and 100 men?

11 (a) If the equation \( x^2 + 2(1+k)x + k^2 = 0 \) has equal roots, find the value of \( k \).
(b) Show that the equation \( 3mx^3 - (2m + 3n)x + 2n = 0 \) has rational roots.

12 Given the equation
\[
4x^5 + 3x^2 - 40x^2 - x + 10 = 0
\]
Without solving the equation, fill out the following statements by placing the proper number in each parenthesis; justify each statement by quoting the appropriate theorem or principle:

(a) The equation has \( \_ \) roots.
(b) It has no more than \( \_ \) positive roots and no more than \( \_ \) negative roots.
(c) It has at least \( \_ \) fractional roots.
(d) It has at least \( \_ \) imaginary roots.
(e) All the integral roots, if any, must be factors of \( \_ \).
(f) The product of the roots is \( \_ \).
(g) The equation has at least \( \_ \) real roots.

10 A man lends \$2100 in two amounts at different rates of interest, and the two sums produce equal returns. If the first portion had been lent at the second rate it would have produced \$48; if the second portion had been lent at the first rate it would have produced \$27. Find the rates.