1. *Cubic Equation*

BEGIN

/

PRINT " Input the coefficient of x^3: "

READ a

DEFINE a AS integer

PRINT " Input the coefficient of x^2: "

READ b

DEFINE b AS integer

PRINT " Input the coefficient of x: "

READ c

DEFINE c AS integer

PRINT " Input the constant: "

READ d

DEFINE d AS integer

q <-- ((((2 \* (b \*\* 3)) - (9 \* a \* b \* c) + (27 \* d \* (a \*\* 2))) \*\* 2) - (4 \* (((b \*\* 2) - (3 \* a \* c)) \*\* 3))) \*\* (1 / 2)

r <-- (0.5 \* (q + (2 \* (b \*\* 3)) - (9 \* a \* b \* c) + (27 \* d \* (a \*\* 2)))) \*\* (1 / 3)

s <-- ((b \*\* 2) - (3 \* a \* c))

y <-- complex (1, (3 \*\* (1 / 2)))

z <-- complex (1, -(3 \*\* (1 / 2)))

IF (s == 0) AND NOT (q == 0):

x1 <-- -(b / (3 \* a)) - (r / (3 \* a)) - (s / (3 \* a \* r))

x2 <-- -(b / (3 \* a)) + ((r \* y) / (6 \* a)) + ((s \* z) / (6 \* a \* r))

x3 <-- -(b / (3 \* a)) + ((r \* z) / (6 \* a)) + ((s \* y) / (6 \* a \* r))

PRINT(f"x1 = {x1}, x2 = {x2}, x3 = {x3}")

ELSE IF (s == 0) AND (q == 0):

x1 = x2 = x3 = -(b / (3 \* a))

PRINT(f"x1 = {x1}, x2 = {x2}, x3 = {x3}")

ELSE IF (q == 0) AND NOT (s == 0):

x1 = x2 = ((b \* c) - (9 \* a \* d)) / (2 \* ((3 \* a \*c) - (b \*\* 2)))

x3 = ((9 \* (a \*\* 2) \* d) - (4 \* a \* b \* c) + (b \*\* 3)) / (a \* ((3 \* a \* c) - (b \*\* 2)))

PRINT(f"x1 = {x1}, x2 = {x2}, x3 = {x3}")

END

r

1. *Quartic Equation*

BEGIN

//Roots of a Quadratic Equation

PRINT " Input the coefficient of x^2: "

READ a

DEFINE a AS integer

PRINT " Input the coefficient of x: "

READ b

DEFINE b AS integer

PRINT " Input the constant: "

READ c

DEFINE c AS integer

.z <-- (b \*\* 2) - (4 \* a \* c)

.y <-- z \*\* (1/2)

.x1 <-- (-b + y) / (2 \* a)

.x2 <-- (-b - y) / (2 \* a)

PRINT(f"The roots of the equation are x1 = {x1} and x2 = {x2}")

END