

1)

x	7	8	9	10
$P(x)$	3	1	1	9

find $P(x)$ for $x=9.5$

$$\begin{aligned}
 P(9.5) &= \frac{(1.5)(0.5)(-0.5)(3)}{(-1)(-2)(-3)} + \frac{(2.5)(0.5)(-0.5)(1)}{(1)(-1)(-2)} \\
 &+ \frac{(2.5)(1.5)(-0.5)(1)}{(2)(1)(-1)} + \frac{(2.5)(1.5)(0.5)(9)}{(2)(1)(3)} \\
 &= 0.1875 - 0.3125 + 0.9375 + 2.8125 = \boxed{3.625} \text{ (Ans)}
 \end{aligned}$$

2)

x	3	7	9	10
$P(x)$	168	120	72	63

find $P(x)$ at $x=6$

$$\begin{aligned}
 P(6) &= \frac{(-1)(-3)(-4)(168)}{(-4)(-6)(-2)} + \frac{3(-3)(-4)(120)}{4(-2)(-3)} \\
 &+ \frac{3(-1)(-4)(72)}{6(2)(-1)} + \frac{3(-1)(-3)(63)}{(7)(3)(1)} \\
 &= 12 + 180 - 72 + 27 = \boxed{147} \text{ (Ans)}
 \end{aligned}$$

3)

x	1	2	7	8
$P(x)$	4	5	5	4

find $P(6)$

$$\begin{aligned}
 P(6) &= \frac{4(-1)(-2)(4)}{(-1)(-6)(-2)} + \frac{5(-1)(-2)(5)}{1(-5)(-6)} + \frac{5(4)(-1)(5)}{6(5)(-1)} \\
 &+ \frac{5(4)(-1)(4)}{7(6)(1)} = -0.26190 + 1.66667 + 1.66667 - 1.90476 \\
 &= \boxed{5.666678} \text{ (Ans)}
 \end{aligned}$$

4)	X	1	2	3	4	7	P_{ind} $P(S)$
	$P(X)$	2	4	8	16	128	

$$\begin{aligned}
 P(S) &= \frac{3(2)(1)(-2)(2)}{(-1)(-2)(-3)(-6)} + \frac{4(2)(1)(-2)(4)}{1(-1)(-2)(-5)} + \frac{4(3)(1)(-2)(8)}{2(1)(-1)(-4)} \\
 &+ \frac{4(3)(2)(-2)(16)}{3(2)(1)(-3)} + \frac{4(3)(2)(1)(128)}{6(5)(4)(3)} = 28.6667 \\
 &\hspace{15em} (Ans)
 \end{aligned}$$

5)	X	10	20	14	16	$P_{ind}; P(S)$
	$P(X)$	0.25	0.2	0.15	0.1	

$$\begin{aligned}
 P(S) &= \frac{(-5)(1)(-1)(0.25)}{(-10)(-4)(-6)} + \frac{5(1)(-1)(0.2)}{10(6)(4)} + \frac{5(-5)(-1)(0.15)}{4(-6)(-2)} \\
 &+ \frac{5(-5)(1)(0.1)}{6(-4)(2)} \\
 &= \cancel{0.073954} \quad 0.073954 \quad (Ans)
 \end{aligned}$$

$$1) \quad x^3 + x - 1 = 0$$

$$0.5 \quad 1 \quad (0.5-1)$$

X	Y
0.5	-0.375
0.6 (x ₁)	-0.184 (y ₁)
0.7 (x ₂)	0.043 (y ₂)
0.8	0.312
0.9	0.629
1	1

$$X = \frac{x_1 y_2 - x_2 y_1}{y_2 - y_1}$$

$$X_0 = \frac{0.6(0.043) - (0.7)(-0.184)}{0.043 + 0.184}$$

$$X_0 = 0.68106 \quad Y_0 = -0.0030$$

(Ans)

$$2) \quad x^3 - 2x + 0.5 = 0$$

$$0 \quad 1$$

X	Y
0 (x ₁)	0.5 (y ₁)
1 (x ₂)	-0.5 (y ₂)
0.5 (x ₀)	-0.375 (y ₀)
0 (x ₁)	0.5 (y ₁)

$$X_0 = \frac{-0.5}{-1.0} = 0.5$$

$$Y_0 = -0.375$$

$$X_3 = 0.25 = 0.28571$$

0.875

$$Y_3 = -0.048$$

(0.28571) (x ₃)	(-0.048) (y ₃)
0 (x ₁)	0.5 (y ₁)

$$X_4 = 0.26068 \quad (\text{Ans})$$

$$Y_4 = -0.0036$$

$$3) \quad x^3 + 2x - 20 = 0$$

$$2 \quad 2.5$$

X	Y
2	-8
2.1	-6.539
2.2	-4.952
2.3	-3.233
2.4 (x ₁)	-1.376 (y ₁)
2.5 (x ₂)	0.625 (y ₂)

$$X_0 = 2.4687656 \quad Y_0 = -0.015227$$

$$X_2 = 2.5 \quad Y_2 = 0.625$$

$$X_3 = 2.46953702 \quad Y_3 = -0.0001752$$

(Ans)

$$4) 3x - \cos x - 1 = 0$$

0 1

X	Y
0(x ₁)	-2(y ₁)
2.1(x ₂)	-0.000152(y ₂)

(Ans)

$$X_0 = \frac{2}{3.000152} = 0.666632891$$

(Ans)

$$Y_0 = -0.000033642$$

$$5) x^3 - 3x - 5 = 0$$

2 2.5

X	Y
2.1	-2.039
2.2(x ₁)	-0.952(y ₁)
2.3(x ₂)	0.267(y ₂)

$$X_0 = 2.2781$$

$$Y_0 = -0.011354$$

$$X_2 = 2.3$$

$$Y_2 = 0.267$$

$$X_3 = 2.2790$$

$$Y_3 = -0.000236$$

(Ans)

$$6) x \log x - 1.2 = 0$$

2 3

X	Y
2(x ₁)	-0.59794(y ₁)
3(x ₂)	0.23136(y ₂)

$$X_0 = 2.25654$$

$$Y_0 = -0.40244$$

$$X_2 = 3$$

$$Y_2 = 0.23136$$

$$X_3 = 2.72861$$

$$Y_3 = -0.01049$$

$$X_4 = 2.74038$$

$$Y_4 = -0.000232$$

$$X_2 = 3$$

$$Y_2 = 0.23136$$

(Ans)

$$7) x^3 - 4x + 1 = 0$$

X	Y
1(x ₁)	-2(y ₁)
2(x ₂)	1(y ₂)

$$X_0 = \frac{1+4}{3} = \frac{5}{3} = 1.67$$

$$Y_0 = -1.022537$$

$$X_2 = 2$$

$$Y_2 = 1$$

$$X_3 = 1.836839$$

$$Y_3 = -0.1499$$

$$X_2 = 2$$

$$Y_2 = 1$$

$$X_4 = 1.8581$$

$$Y_4 = -0.01724$$

$$X_2 = 2$$

$$Y_2 = 1$$

$$X_5 = 1.8605$$

$$Y_5 = -0.00195$$

$$X_2 = 2$$

$$Y_2 = 1$$

$$X_6 = 1.86077$$

$$Y_6 = -0.000229$$

(Ans)

$$8) X^3 + 2X^2 - 8 = 0$$

$$X \quad Y$$

$$= S1(X_1) - S(Y_1)$$

$$2(X_2) \quad 8(Y_2)$$

$$X_0 = \frac{18}{13} = 1.384615 \quad Y_0 = -1.511559$$

$$X_2 = 2$$

$$Y_2 = 8$$

$$X_3 = 1.48239$$

$$Y_3 = -0.34752$$

$$X_2 = 2$$

$$Y_2 = 8$$

$$X_4 = 1.5039$$

$$Y_4 = -0.075176$$

$$X_2 = 2$$

$$Y_2 = 8$$

$$X_5 = 1.50852$$

$$Y_5 = -0.015898$$

$$X_2 = 2$$

$$Y_2 = 8$$

$$X_6 = 1.50949$$

$$Y_6 = -0.00342$$

$$X_2 = 2$$

$$Y_2 = 8$$

$$X_7 = 1.5096996$$

$$Y_7 = -0.00071765$$

(Ans)

$$9) X^3 - 9X + 1$$

$$X \quad Y$$

$$0(X_1) \quad 1(Y_1)$$

$$1(X_2) \quad -7(Y_2)$$

$$X_0 = -0.125 \quad Y_0 =$$

$$X_0 = 0.125$$

$$Y_0 = -0.123$$

$$X_2 = 0$$

$$Y_2 = 1$$

$$X_3 = 0.11131$$

$$Y_3 = -0.00041$$

(Ans)

$$10) X^3 - X - 4 = 0$$

$$X \quad 0$$

$$0 \quad -4$$

$$(X_1) 1 \quad -4(Y_1)$$

$$(X_2) 2 \quad 2(Y_2)$$

$$X_0 = \frac{2+8}{6} = \frac{10}{6} = 1.67$$

$$Y_0 = -1.0125$$

$$X_2 = 2$$

$$Y_2 = 2$$

$$X_3 = 1.79091$$

$$Y_3 = -0.1325$$

$$X_2 = 2$$

$$Y_2 = 2$$

$$X_4 = 1.79452$$

$$Y_4 = -0.0156236$$

$$X_2 = 2$$

$$Y_2 = 2$$

$$X_5 = 1.79611$$

$$Y_5 = -0.001839$$

$$X_2 = 2$$

$$Y_2 = 2$$

$$X_6 = 1.7962973$$

$$Y_6 = -0.00021356$$

(Ans)