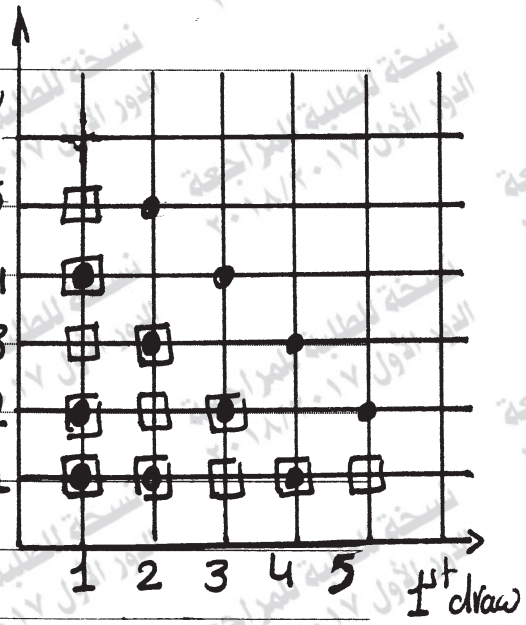
١

1-

(d) 1 [1]

2-



(i) A: the Sum of the two numbers is prime

$P(A) = \frac{11}{25}$ [$\frac{1}{2}$]

B: the product of the two numbers < 7

$P(B) = \frac{12}{25}$ [$\frac{1}{2}$]

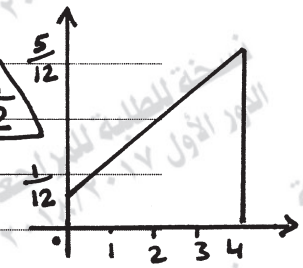
$P(A \cap B) = \frac{7}{25}$ [1]

(ii) P(The product < 7 if Sum is prime)

$= P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{7/25}{11/25}$ [$\frac{1}{2}$]

$= \frac{7}{11}$ [$\frac{1}{2}$]

3-



(i) $P(x<2) = P(0<x<2)$ ½

$= \frac{1}{2}[f(0)+f(2)](2-0)$ ½ ½

$= \frac{1}{12} + \frac{3}{12} = \frac{1}{3}$ ½

(ii) $P(2<x<5) = P(2<x<4)$ ½

$= \frac{1}{2}[f(2)+f(4)](4-2)$ ½

$= \frac{3}{12} + \frac{5}{12} = \frac{2}{3}$ ½

(تراعى الحلول الأخرى)

4-

(a) $\frac{4}{25}$ (1)

5-

(a) $f(x) = \frac{x^2+1}{8}$ (1)

6-

(a) $P(X < k) = 0.1587$

$P\left(Z < \frac{k-15}{5}\right) = 0.1587$ ($\frac{1}{2}$)

$0.5 - P\left(0 < Z < \frac{15-k}{5}\right) = 0.1587$ ($\frac{1}{2}$)

$P\left(0 < Z < \frac{15-k}{5}\right) = 0.5 - 0.1587$ ($\frac{1}{2}$)

$= 0.3413$ ($\frac{1}{2}$)

$\therefore \frac{15-k}{5} = 1$ ($\frac{1}{2}$) $\therefore k = 10$ ($\frac{1}{2}$)

(b) $P(X > 180) = P\left(Z > \frac{180-175}{5}\right)$ (1)

$= P(Z > 1) = 0.5 - P(0 < Z < 1)$ (1)

$= 0.5 - 0.3413 = 0.1587$ ($\frac{1}{2}$)

$\therefore$ The number of students $= 0.1587 \times 1500$

$\simeq 238$ Student ($\frac{1}{2}$)

7-

(c) 0.68 (1)

(تراعى الحلول الأخرى)

8-

(b) 1.53 (1)

9-

X	Y	Rank X	Rank Y	D	D^2
60	80	6	4.5	1.5	2.25
50	90	5	6	-1	1
10	50	1	1	0	0
20	60	2	2	0	0
30	70	3	3	0	0
40	80	4	4.5	-0.5	0.25
		(1/2)	(1/2)		3.5 (1/2)

$$r = 1 - \frac{6\Sigma D^2}{n(n^2-1)} = 1 - \frac{6 \times 3.5}{6(36-1)} = 0.9$$

(1/2) (1/2)

(Direct Corr.) (1/2)

10-

The mean $= \mu = 2$

The variance σ^2

$= \sum x_r^2 \cdot f(x_r) - \mu^2$

$= \frac{31}{6} - (2)^2 = \frac{7}{6}$

x_r	$f(x_r)$	$x_r \cdot f(x_r)$	$x_r^2 \cdot f(x_r)$
0	1/6	0	0
1	1/12	1/12	1/12
2	1/3	2/3	4/3
3	5/12	15/12	45/12
		2	$\frac{31}{6}$

(1/2) (1/2)

The standard deviation $= \sigma = \sqrt{\sigma^2}$

$\sigma = \sqrt{\frac{7}{6}} = \frac{\sqrt{42}}{6} \simeq 1.08$ (1/2) (1/2)

(تراعى الحلول الأخرى)

11-

(b) $\frac{1}{2}$ (1)

12-

(d) 0.0668 (1)

13-

1st $r = \frac{n\Sigma xy - \Sigma x \Sigma y}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$ (1)

$r = \frac{6 \times 56 - 6 \times 21}{\sqrt{[6 \times 76 - (6)^2][6 \times 91 - (21)^2]}}$ (1)

$r = \frac{210}{210} = 1$ (1)

(Direct Perfect Corr.)

2nd $\hat{y} = a + bx$

$b = \frac{n\Sigma xy - \Sigma x \Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$ ($\frac{1}{2}$)

$b = \frac{5 \times 56 - 6 \times 21}{6 \times 76 - (6)^2} = \frac{1}{2}$ ($\frac{1}{2}$)

$a = \frac{\Sigma y - b\Sigma x}{n}$ ($\frac{1}{2}$) $= \frac{21 - \frac{1}{2} \times 6}{6} = 3$ ($\frac{1}{2}$)

∴ The regression line equation:

$\hat{y} = 3 + \frac{1}{2}x$ (1)

(تراعى الحلول الأخرى)

(انتهت الإجابة وتراعى الحلول الأخرى)