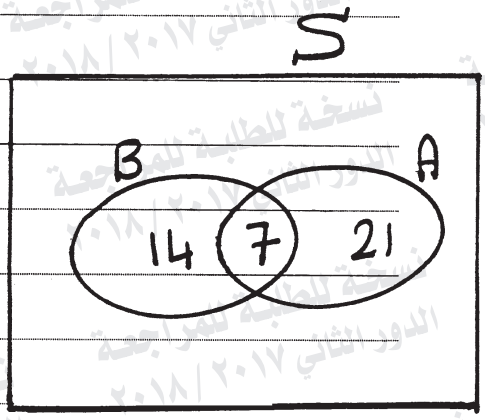
١

1-

(a) 3 ١

2-



A: Study English

B: Study Italian

$P(A) = \frac{28}{42}$

$P(B) = \frac{21}{42}$, $P(A \cap B) = \frac{7}{42}$ ١

(i) $P(\text{one language at least}) = P(A \cup B)$

$= P(A) + P(B) - P(A \cap B)$ ½

$= \frac{28}{42} + \frac{21}{42} - \frac{7}{42} = 1$ ½

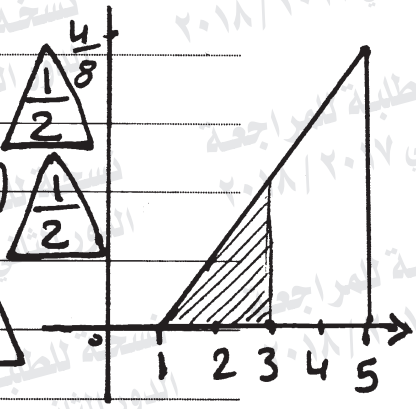
(ii) $P(A|B) = \frac{P(A \cap B)}{P(B)} \overset{\frac{1}{2}}{=} \frac{7/42}{21/42} = \frac{1}{3}$ ½

3-

(i) $P(X<3) = P(1<X<3)$

$= \frac{1}{2}[f(1)+f(3)](3-1)$

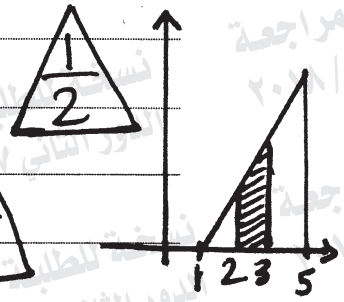
$= \text{zero} + \frac{2}{8} = \frac{1}{4}$



(ii) $P(2<X<3)$

$= \frac{1}{2}[f(2)+f(3)](3-2)$

$= \frac{1}{2} \times [\frac{1}{8}+\frac{2}{8}] = \frac{3}{16}$



(تراعى الحلول الأخرى)

4-

(b) $\frac{5}{6}$ (1)

5-

(a) 1 (1)

6-

(a) $P(X > K) = 0.1587$

$P(Z > \frac{K-48}{8}) = 0.1587$ ($\frac{1}{2}$)

$0.5 - P(0 < Z < \frac{K-48}{8}) = 0.1587$ ($\frac{1}{2}$)

$P(0 < Z < \frac{K-48}{8}) = 0.5 - 0.1587$ ($\frac{1}{2}$)

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

$\therefore \frac{K-48}{8} = 1$ ($\frac{1}{2}$)

$\therefore K - 48 = 8 \quad \therefore K = 56$ ($\frac{1}{2}$)

(b) $P(60 < X < 85) = P(\frac{60-75}{10} < Z < \frac{85-75}{10})$ (1)

$= P(-1.5 < Z < 1)$ ($\frac{1}{2}$)

$= P(0 < Z < 1.5) + P(0 < Z < 1)$ ($\frac{1}{2}$)

$= 0.4332 + 0.3413$

$= 0.7745$ ($\frac{1}{2}$)

$\therefore$ The percentage of the number of workers $= 0.7745 \times 100$

$= 77.45\ \%$ ($\frac{1}{2}$)

7-

(d) 0.2 (1)

(تراعى الحلول الأخرى)

8-

(c) 1.27 (1)

9-

X	Y	Rank of X	Rank of Y	D	D^2
80	75	6	5	1	1
60	80	5	6	-1	1
20	40	1	1	0	0
30	50	2	2	0	0
40	60	3	3	0	0
50	70	4	4	0	0
					2

$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

$$r = 1 - \frac{6\Sigma D^2}{n(n^2-1)} \quad \frac{1}{2}$$

$$r = 1 - \frac{6 \times 2}{6(36-1)} = 0.9429 \quad \frac{1}{2}$$

(Direct Corr.) $\frac{1}{2}$

10-

The mean $= \mu$
$= 2.5$ (1/2)

The variance $= \sigma^2$
$= \sum x_i^2 \cdot f(x_i) - \mu^2$
$= 7 - (2.5)^2$
$= 0.75$ (1)

The standard deviation
$= \sigma = \sqrt{0.75}$
$= \frac{\sqrt{3}}{2} = 0.867$ (1/2)

x_i	$f(x_i)$	$x_i \cdot f(x_i)$	$x_i^2 \cdot f(x_i)$
1	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
2	$\frac{3}{8}$	$\frac{6}{8}$	$\frac{12}{8}$
3	$\frac{3}{8}$	$\frac{9}{8}$	$\frac{27}{8}$
4	$\frac{1}{8}$	$\frac{4}{8}$	$\frac{16}{8}$
		2.5 (1/2)	7 (1/2)

(تراعى الحلول الأخرى)

11-

(b) $\frac{1}{3}$ (1)

12-

(d) 0.9332 (1)

13-

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

$r = \frac{6 \times 41 - 3 \times 12}{\sqrt{[6 \times 19 - (3)^2][6 \times 94 - (12)^2]}}$ (1)

$r = 1$ (1) (Perfect direct Corr.)

(Second) The regression line eq. :

$\hat{y} = a + bx$ ($\frac{1}{2}$)

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

$b = \frac{6 \times 41 - 3 \times 12}{6 \times 19 - (3)^2} = 2$ ($\frac{1}{2}$)

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

$a = \frac{12 - 2 \times 3}{6} = 1$ ($\frac{1}{2}$)

∴ The regression line eq. :

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

(تراعى الحلول الأخرى)

(انتهت الإجابة وتراعى الحلول الأخرى)