Revision F5 (October Exam) A [43] MARKSCHEME

1.

In 2002, weight is 0.8 of 2001 B1

Accept 80%

Increase is 0.2

$\%\text{ increase} = \frac{0.2}{0.8} \times 100$

$\left[\text{or } \frac{20}{80} \times 100\right]$ M1

Or return to 2001, $\times \frac{1}{0.8}$

1.25 or 125% *M1*

= 25% A1

Hence 25% *A1*

[3]

2.

$y = kx^2$ *or* $y \quad a \quad x^2$ M1

oe $5 = k \times 16$

$k = 0.3125$ A1

oe

20 A1

[3]

3.

(a) 6 dinners [B1]

(b) Product of 5 integers, reducing by 1 each time [M1]

$8 \times 7 \times 6 \times 5 \times 4 \times 3 = 6720$ [A1]

4.

(a) $2\sqrt{2} + 5\sqrt{2}$ B1

Either

$= 7\sqrt{2}$ B1

(b) $\sqrt{24} + \sqrt{54} = 2\sqrt{6} + 3\sqrt{6}$

$= 5\,6$ B1

$\sqrt{192} + \sqrt{1200} + \sqrt{432} + \sqrt{2700}$ *B1*

$(\sqrt{8} + \sqrt{50})(\sqrt{24} + \sqrt{54}) = 7\sqrt{2} \times 5\sqrt{6}$

$= 35\sqrt{12}$ or $35\sqrt{2}\,\sqrt{6}$ or $35\sqrt{4}\,\sqrt{3}$ B1

$8\sqrt{3} + 20\sqrt{3} + 12\sqrt{3} + 30\sqrt{3}$ *B1*

$= 70\sqrt{3}$ B1

[5]

5.

$2.8\ cm^2 = 42$ **or** $1\ cm^2 = 15$ M1

Linking up correctly
oe eg counting small squares
70 small squares = 42 leaves

Obtaining area of $4.2\ cm^2$ M1

Area correct
Obtaining area of 105 small squares

4.2×15 M1

Scaling up their area, good attempt at area
$105 \times \frac{42}{70}$ *or* 105×0.6

$= 63$ A1

[4]

Alternative methods:

Method 1

Taking area of 1st block as 10×4 etc gives
$10 \times 4 = 40$
$5 \times 20 = 100$
Total area of 140 represents 42

$\frac{42}{140} = 0.3$	M1 for either $\frac{42}{140}$ or 0.3	**or** $\frac{140}{42} = \frac{10}{3}$	M1
Area above $60 = 14 \times 15 = 210$	M1	area = 210	M1
210×0.3	M1	$210 \div \frac{10}{3}$	M1
$= 63$	A1	$= 63$	A1

Method 2

Using scale of 1 cm to 1 unit on vertical scale
$10 \times 0.8 = 8$
$5 \times 4 = 20$
Total 28

$\frac{42}{28}$ or 1.5 M1
Area over $60 = 14 \times 3 = 42$ M1
42×1.5 M1
$= 63$ A1

Method 3

Using multiples of single lines of 5 small squares
Area under 25 = 14 lines
14 lines = 42

1 line = $\frac{42}{14}$ or 3 M1
Area over 60 = 21 lines M1
21×3 or $21 \times \frac{42}{14}$ M1
$= 63$ A1

[4]

6.

(a) Cos 22° or sin 68° seen M1

18.3 × cos 22° M1

or 18.3 × sin 68°

16.96 to 17 A1

M2 may be assumed from 16.9

(b) Tan Z = $\frac{10}{3}$ Use of tangent M1

Tan Z = $\frac{10}{3}$ M1

73 to 73.3 A1

[6]

7.

(a) (i) $-5\mathbf{a} + 5\mathbf{b}$ B1

(ii) $\mathbf{a} + \frac{3}{5}$ their$(-5\mathbf{a} + 5\mathbf{b})$ M1

condone one error (eg, missing brackets)

$2\mathbf{b} - \mathbf{a}$ A1

(b) $\overrightarrow{PR} = -4\mathbf{a} + 5\mathbf{b} + 3\mathbf{b}$ M1

$= -4\mathbf{a} + 8\mathbf{b}$ or $4(2\mathbf{b} - \mathbf{a})$ A1

alternatively: $\overrightarrow{QR} = \frac{3}{5}(5a + 5b) + 3b$

$= 6b - 3a = 3(2b - a)$

$\overrightarrow{PR}$ is a multiple of $\overrightarrow{PQ}$ A1

hence points are co-linear

$\overrightarrow{QR}$ *is a multiple of* $\overrightarrow{PQ}$

hence points are co-linear oe

[6]

8.

$y = -\frac{1}{2}x + \frac{3}{2}$	P1	for a process to find the gradient of the line AB
	P1	(dep) for a process to find the gradient of a perpendicular line eg use of $-1/m$
	P1	(dep on P2) for substitution of $x=5$, $y=-1$
	A1	equation stated oe

9.

$\frac{1}{12} \times \ldots$ or $\frac{2}{12} \times \ldots$ or $\frac{3}{12} \times \ldots$ M1

Any first probability multiplied by some other probability seen

$\frac{1}{12} \times \frac{1}{11}$ or $\frac{2}{12} \times \frac{2}{11}$

or $\frac{3}{12} \times \frac{2}{11}$ M1

Any correct product of two probabilities

$\times 2$ M1

All correct products doubled
(may come later)

$\left(\frac{1}{12}\times\frac{1}{11}\right) + \left(\frac{2}{12}\times\frac{2}{11}\right)$

$+ \left(\frac{3}{12}\times\frac{2}{11}\right)$ M1

Adding exactly 3 (or 6) correct products

$= \frac{1}{6}$ A1

oe 0.16, 0.17, 16% or 17% from correct method

SC3 for question with replacement fully correct $\Rightarrow \frac{22}{144}$

[5]

10.

$\frac{1200}{\sin 145.2} = \frac{TC}{\sin 21.5}$ M1

$\frac{1200}{\sin 145.2} = \frac{AT}{\sin 13.3}$

$(\frac{\sin 21.5}{\sin 145.2}) \times 1200 or 770.6...$ M1,M1

$(\frac{\sin 13.3}{\sin 145.2}) \times 1200 or 483.7...$

(their 770.6...) × sin 13.3 A1

(their 483.7...) × sin 21.5

177.2(8...)

[4]