SUGGESTED ANSWER MAT112 – SET 2

QUIZ - 10% (OCTOBER 2022)

<table>
<tr><th>No.</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1a)</td><td>
<table>
<tr><th>Fraction</th><th>Decimal</th><th>Percentage (%)</th></tr>
<tr><td>$\frac{47}{8}$ B1</td><td>5.875</td><td>587.5% B1</td></tr>
<tr><td>$\frac{37}{50}$</td><td>0.74 B1</td><td>74%</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>1b i)</td><td>$\frac{3}{2}y + 2 = y - 5$
$\frac{3}{2}y - y = -5 - 2$ M1
$\frac{3}{2}y - y = -7$
$3y - 2y = -14$ M1
$y = -14$ A1</td><td>3</td></tr>
<tr><td>1b ii)</td><td>$\frac{3}{4}(8 - 12y) + \frac{1}{4} = y + 7$
$6 - 9y + \frac{1}{4} = y + 7$ M1
$-9y - y = 7 - \frac{1}{4} - 6$ M1
$-10y = \frac{3}{4}$ M1
$y = -\frac{3}{40}$ A1</td><td>4</td></tr>
<tr><td>2a)</td><td>$a = 50,\ d = -17$
$T_n = a + (n-1)d$
$T_{15} = 50 + (15-1)(-17)$ M1
$T_{15} = -188$ A1</td><td>2</td></tr>
</table>

2b i)	$T_7 : 39 = a+(7-1)d$ $39 = a+6d$ ..... (1) **M1** $T_{10} : 51 = a+(10-1)d$ $51 = a+9d$ ..... (2) **M1** (2) – (1): $51 = a+9d$ $39 = a+6d$ **M1** $12 = 3d$ $d = 4$ **A1** $d = 4$ into (1): $39 = a+6d$ $39 = a+6(4)$ **M1** $a = 15$ **A1**	6
2b ii)	$S_{15} = \frac{n}{2}[2a+(n-1)d]$ $= \frac{15}{2}[2(15)+(15-1)(4)]$ **M1** $= 645$ **A1**	2
2c)	$T_n = ar^{n-1}$: $T_{11} = 15r^{11-1}$ $15360 = 15r^{10}$ **M1** $\frac{15360}{15} = r^{10}$ **M1** $r^{10} = 1024$ $r = \sqrt[10]{1024}$ **M1** $r = 2$ **A1**	4

2d i)	$T_n = ar^{n-1}$ $\frac{2187}{512} = \left(\frac{1}{4}\right)\left(\frac{3}{2}\right)^{n-1}$ **M1** $\frac{2187}{218} = \left(\frac{3}{2}\right)^{n-1}$ $\log\left(\frac{2187}{218}\right) = \log\left(\frac{3}{2}\right)(n-1)$ **M1** $\frac{\log\left(\frac{2187}{218}\right)}{\log\left(\frac{3}{2}\right)} = n-1$ **M1** $n = 8$ **A1**	4
2d ii)	$S_n = \frac{a(r^n - 1)}{r-1}$ $S_8 = \frac{\left(\frac{1}{4}\right)\left(\left(\frac{3}{2}\right)^8 - 1\right)}{\frac{3}{2} - 1}$ **M1** $S_8 = \frac{6305}{512}$ **A1**	2