February Break Homework

19

1) Area $= \frac{1}{2} ab \sin(C)$

$= \frac{1}{2} \times 15 \times 18 \times \sin(70)$ ✓

$= 126.86\ m^2$ (2dp) ✓

2) $a^2 = b^2 + c^2 - 2bc\cos(A)$

$a^2 = 15^2 + 18^2 - (2 \times 15 \times 18 \times \cos(70))$ ✓

$a^2 = 364.309$ ✓

$a = 19.09\ m$ (2dp) ✓

3) $\underline{u} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ $\underline{v} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$

$4\underline{u} - 2\underline{v} = \begin{pmatrix} 12 \\ 8 \end{pmatrix} - \begin{pmatrix} 2 \\ 6 \end{pmatrix}$ ✓

$= \begin{pmatrix} 10 \\ 2 \end{pmatrix}$ ✓

4) B (8, 8, 0) ✓

C (0, 8, 0) ✓

D (4, 4, 10) ✓

5) $2\underline{a} + 3\underline{b} = \begin{pmatrix} 6 \\ 8 \end{pmatrix} + \begin{pmatrix} 0 \\ -24 \end{pmatrix} = \begin{pmatrix} 6 \\ -16 \end{pmatrix}$ ✓

$|2\underline{a} + 3\underline{b}| = \left|\begin{pmatrix} 6 \\ -16 \end{pmatrix}\right| = \sqrt{6^2 + 16^2}$ ✓ $= 2\sqrt{73}$ ✓

$= 17.09$ (2dp)

6) Angle KWP

$$\frac{600}{\sin(120)} = \frac{350}{\sin(x)}$$ ✓

$$\frac{\sin(120)}{600} = \frac{\sin(x)}{350}$$

$$\sin(x) = \frac{350\sin(120)}{600}$$

$$x = \sin^{-1}\left(\frac{350\sin(120)}{600}\right)$$ ✓

$$x = 30.34°$$

∴ The bearing of Possum from Wallaby

$= 180 - 30.34°$

$= 149.66°$ (2dp) ✓

7) $5\frac{2}{3} \times 2\frac{1}{7}$

$= \frac{17}{3} \times \frac{15}{7}$ ✓

$= \frac{255}{21}$ ✓

$= \frac{85}{7}\ m^2$ ✓