(6)(a)(i) $\sin 2p = 2\sin p \cos p$

$= 2\left(\frac{1}{\sqrt{5}}\right)\left(\frac{2}{\sqrt{5}}\right)$

$= \frac{4}{5}$

$a^2 = (\sqrt{5})^2 - 1^2$

$= 5 - 1$

$= 4$

$a = 2$

(ii) $\cos 2p = 1 - 2\sin^2 p$

$= 1 - 2\left(\frac{1}{\sqrt{5}}\right)^2$

$= 1 - \frac{2}{5}$

$= \frac{3}{5}$

(b) $\sin 4p = 2\sin 2p \cos 2p$

$= 2 \times \frac{4}{5} \times \frac{3}{5}$

$= \frac{24}{25}$

Question			Generic scheme	Illustrative scheme	Max mark
6.	(a)	(i)	•1 find value of $\cos p$ •2 substitute into the formula for $\sin 2p$ •3 simplify answer	•1 $\cos p = \frac{2}{\sqrt{5}}$ stated or implied by •2 •2 $2\times\frac{1}{\sqrt{5}}\times\frac{2}{\sqrt{5}}$ •3 $\frac{4}{5}$	3
		(ii)	•4 evaluate $\cos 2p$	•4 $\frac{3}{5}$	1

Notes:

1. Evidence for •1 may appear in (a)(ii).
2. Where a candidate substitutes an incorrect value for $\cos p$ at •2, •2 may be awarded if the candidate has previously stated this incorrect value or it can be implied by a diagram or Pythagoras calculation. See Candidates A and B.
3. Where a candidate explicitly states a value for $\cos p$, subsequent working must follow from that value for •2 to be awarded.
4. •3 is only available as a consequence of substituting into a valid formula at •2.
5. Do not penalise trigonometric ratios which are less than −1 or greater than 1 throughout this question.

Commonly Observed Responses:

Candidate A – incorrect use of Pythagoras

$\sqrt{\sqrt{5}^2+1^2}=\sqrt{6}$ •1 ✗

$2\times\frac{1}{\sqrt{5}}\times\frac{\sqrt{6}}{\sqrt{5}}$ •2 ✓1

$\frac{2\sqrt{6}}{5}$ •3 ✓1

Candidate B – no evidence of Pythagoras

•1 ^

$2\times\frac{1}{\sqrt{5}}\times\frac{\sqrt{6}}{\sqrt{5}}$ •2 ✗

$\frac{2\sqrt{6}}{5}$ •3 ✓1

Candidate C

$2\times\sin\frac{1}{\sqrt{5}}\times\cos\frac{2}{\sqrt{5}}$ •1 ✓ •2 ✗

$\frac{4}{5}$ •3 ✗

	(b)		•5 evaluate $\sin 4p$	•5 $\frac{24}{25}$	1

Notes:

6. •5 is only available for an answer expressed as a single fraction.

Commonly Observed Responses: