| Question Number | Scheme | Marks |
|---|---|---|
| **3. (a)** | $S_{mp} = 32958 - \frac{1124 \times 281}{10}$ [= 1373.6] **(*)** | B1cso (1) |
| **(b)** | $[r =] \frac{1373.6}{\sqrt{6046.4 \times 382.9}}$ | M1 |
| | = 0.9027… awrt **0.903** | A1 (2) |
| **(c)** | In scatter diagram points are close to a line or $r$ is close to (or near to) 1<br>It is consistent with the manager's belief | B1 (1) |
| **(d)** | $\frac{\sum m}{\sum p} = \frac{1124}{281}$ (o.e) | M1 |
| | So $k =$ **4** | A1 (2) |
| **(e)** | $b = \frac{1373.6}{6046.4}$ [= 0.22717...] | M1 |
| | $a = 28.1 - "0.2271..." \times 112.4$ [ = 2.5653…] | M1 |
| | $p = 2.565\ldots + 0.2271\ldots m$ **$p = 2.57 + 0.227m$** | A1; A1 (4) |
| **(f)** | [2.565…+ 0.2271… × 70 = ] 18.467… accept answers in range **[18, 18.6]** | B1 (1) |
| **(g)** | Manager's model (when $m = 70$) estimates $p = 17.5$<br>So use manager's model since wants the lower estimate. (o.e.) | B1ft<br>dB1 (2) |
| | | **[13]** |

| | Notes |
|---|---|
| **(a)** | B1cso for a correct expression seen (need all 4 numbers seen) |
| **(b)** | M1 for a correct expression or an answer only of 0.90 (2sf) or 0.902 (truncation)<br>A1 for awrt 0.903 |
| **(c)** | B1 for "points close to a line" or "$r$ is close to 1" or "strong correlation" (o.e.)<br>but "nearer to 1" is B0<br>and "consistent with manager" or " consistent with belief" (o.e.) or "yes" |
| **(d)** | M1 for a correct calculation or equation in $k$<br>A1 for $k = 4$ NB using the point (140, 35) is M0A0 despite giving $k = 4$ |
| **(e)** | 1st M1 for a correct expression for $b$<br>2nd M1 for a correct equation in $a$ (ft their value of $b$ or even letter $b$ in correct formula)<br>1st A1 for $b$ = awrt 0.227 in an equation in $p$ and $m$ or allow $y$ and $x$<br>Allow a transciption error (e.g. 0.277 etc) if 0.227 is seen in earlier working.<br>2nd A1 for $a$ = awrt 2.57 in an equation in $p$ and $m$ only |
| **(g)** | 1st B1ft for 17.5 or $70 \div k$ for their value of $k$<br>2nd dB1 (dep on 1st B1) for therefore choosing manager's model because it has the lower estimate. (o.e.) ( Must be true for their values) |