| Simultaneous Equations (Linear) Mark Scheme |  |  |
| :---: | :---: | :---: |
| 1(a) | $\begin{aligned} & 6 x+3 y=12 \\ & 6 x+18 y=42 \end{aligned}$ | [1] Multiply $2^{\text {nd }}$ equation by 3 to get the same 'quantities' of $x$ |
|  | $\begin{gathered} 15 y=30 \\ \text { Hence } y=2 \end{gathered}$ | [1] (2 $2^{\text {nd }}-1^{\text {st }}$ equation) |
|  | $\begin{gathered} 6 x+3(2)=12 \\ 6 x=6 \\ x=1 \end{gathered}$ | [1] Sub $y=2$ back into equation 1 Correct answer for $x$ and $y$ |
| 1(b) | $\begin{aligned} & 6 x-15 y=48 \\ & 6 x+4 y=10 \end{aligned}$ | [1] Attempt to manipulate equations to get $x$ or $y$ the same |
|  | $\begin{gathered} 19 y=-38 \\ y=-2 \end{gathered}$ | [1] (2 $2^{\text {nd }}-1^{\text {st }}$ equation) |
|  | $\begin{gathered} 3 x+2(-2)=5 \\ x=3 \end{gathered}$ | [1] Correct answer for $x$ and $y$ |
| 2(a) | $\begin{gathered} 2 x+4 y=14 \\ 4 x-4 y=4 \end{gathered}$ | [1] Add the two equations together |
|  | $\begin{aligned} 6 x & =18 \\ x & =3 \end{aligned}$ | [1] Finding value of $x$ |
|  | $\begin{gathered} 6+4 y=14 \\ y=2 \end{gathered}$ | [1] Finding value of $y$ |
| 2(b) | $\begin{gathered} 9 x-3 y=69 \\ 2 x+3 y=8 \end{gathered}$ | [1] Add the two equations together |
|  | $\begin{aligned} 11 x & =77 \\ x & =7 \end{aligned}$ | [1] Finding value of $x$ |
|  | $\begin{gathered} 14+3 y=8 \\ y=-2 \end{gathered}$ | [1] Finding value of $y$ |
| 3 | $\begin{gathered} 2 a+3 c=20 \\ a+4 c=15 \end{gathered}$ | [1] Setting up simultaneous equations |
|  | $\begin{aligned} & 2 a+3 c=20 \\ & 2 a+8 c=30 \end{aligned}$ | [1] Multiply lower equation by 2, subtract to eliminate $a$ |
|  | $\begin{aligned} & 5 c=10 \\ & \therefore c=2 \end{aligned}$ | [1] Finding value of $c$ |
|  | $\begin{gathered} a+4(2)=15 \\ \quad \therefore a=7 \end{gathered}$ | [1] Substitute in to find $a$ |
|  |  |  |


| 4 | $\begin{aligned} & 50 x+80 y=340 \\ & 25 x+50 y=200 \end{aligned}$ | [1] Writing correct equations (using any letters) |
| :---: | :---: | :---: |
|  | $\begin{aligned} & 50 x+80 y=340 \\ & 50 x+100 y=400 \end{aligned}$ | [1] Attempt to manipulate equations |
|  | $\begin{aligned} & x=2 \\ & y=3 \end{aligned}$ | [1] Correct $x$ or $y$ value |
|  | Student ticket is $£ 2$ Parents ticket is $£ 3$ | [1] Final answer |
| 5(a) | $\begin{gathered} x+2 y=-1 \\ 2 y-5 x=23 \end{gathered}$ | [1] Attempt to manipulate equations to get $x$ or $y$ the same |
|  | $x=-4$ | [1] Correct answer for $x$ |
|  | $y=1.5$ | [1] Correct answer for $y$ |
| 5(b) | $(-4,1.5)$ | [1] Final answer |
| 6 | $\begin{aligned} & 5 a+4 b=5.70 \\ & 4 a+2 b=3.60 \end{aligned}$ | [1] Writing correct equations (using any letters) |
|  | $\begin{aligned} & 5 a+4 b=5.70 \\ & 8 a+4 b=7.20 \end{aligned}$ | [1] Attempt to manipulate equations |
|  | $\begin{aligned} a & =£ 0.50 \text { or } 50 \mathrm{p} \\ b & =£ 0.80 \text { or } 80 \mathrm{p} \end{aligned}$ | [1] Final answer |
| 7 | $\begin{gathered} 3(1)-p(2)=4 \\ 4(1)-3(2)+q=0 \end{gathered}$ | [1] Substitute in solution |
|  | $\begin{aligned} & 3-2 p=4 \\ & -2+q=0 \end{aligned}$ | [1] Solve to find $p$ and $q$ |
|  | $\therefore q=2$ | [1] Correct value |
|  | $\begin{aligned} & 2 p=-1 \\ & \therefore p=-\frac{1}{2} \end{aligned}$ | [1] Rearranging for $p$ |
| 8(a) | $\begin{gathered} 8 a=88 \\ 88 \div 8=11 \\ a=11 \mathrm{~cm} \end{gathered}$ | [1] Final answer |
| 8(b) | $\begin{aligned} & 2 x+y=11 \\ & -4 x+3 y=8 \end{aligned}$ | [1] Writing correct equations from diagram |
|  | $\begin{aligned} & 6 x+3 y=33 \\ & -4 x+3 y=8 \end{aligned}$ | [1] Attempt to manipulate equations |
|  | $\begin{aligned} & x=2.5 \\ & y=6 \end{aligned}$ | [1] Final answer |

