2(a)	Shear, [x-axis fixed]
	With $(0,1)$ mapped to $\left(\frac{3}{2},1\right)$.
2(b)	Shear, [y-axis fixed],
	with $(1,0)$ mapped to $\left(1,\frac{3}{2}\right)$.
2(c)	$\mathbf{AB}=\begin{pmatrix}\frac{13}{4} & \frac{3}{2}\\ \frac{3}{2} & 1\end{pmatrix}$ or $\det\mathbf{AB}=\det\mathbf{A}\det\mathbf{B}$
	$\det\mathbf{AB}=1$
2(d)	$\begin{pmatrix}\frac{13}{4} & \frac{3}{2}\\ \frac{3}{2} & 1\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}\frac{13}{4}x+\frac{3}{2}y\\ \frac{3}{2}x+y\end{pmatrix}$
	$\frac{3}{2}x+mx=m\left(\frac{13}{4}x+\frac{3}{2}mx\right)$
	$\frac{3}{2}+m=\frac{13}{4}m+\frac{3}{2}m^2\Rightarrow m^2+\frac{3}{2}m-1=0$
	$y=-2x$ and $y=\frac{1}{2}x$.

4(a)(i)	Stretch
	parallel to the x-axis, scale factor k.
4(a)(ii)	Enlargement,
	centre the origin, scale factor k.
4(b)	$\begin{pmatrix}0 & 1\\ -1 & 1\\ 1 & 1\end{pmatrix}\begin{pmatrix}k & 0\\ 0 & m\end{pmatrix}\begin{pmatrix}2 & -1 & 1\\ 1 & 1 & 2\end{pmatrix}=\begin{pmatrix}0 & m\\ -k & m\\ k & m\end{pmatrix}\begin{pmatrix}2 & -1 & 1\\ 1 & 1 & 2\end{pmatrix}$
	$\begin{pmatrix}m & m & 2m\\ -2k+m & k+m & -k+2m\\ 2k+m & -k+m & k+2m\end{pmatrix}$
	$m\begin{vmatrix}k+m & -k+2m\\ -k+m & k+2m\end{vmatrix}-m\begin{vmatrix}-2k+m & -k+2m\\ 2k+m & k+2m\end{vmatrix}+2m\begin{vmatrix}-2k+m & k+m\\ 2k+m & -k+m\end{vmatrix}$
	$=m(k+m)(k+2m)-m(-k+m)(-k+2m)-m(-2k+m)(k+2m)$ $+m(2k+m)(-k+2m)+2m(-2k+m)(-k+m)-2m(2k+m)(k+m)$ $=6m^2k+6m^2k-12m^2k=0$

4(a)	A rotation, followed by a shear.

4(b)	$\mathbf{M}=\begin{pmatrix}\cos\theta+2\sin\theta & 2\cos\theta-\sin\theta\\ \sin\theta & \cos\theta\end{pmatrix}$
	$\begin{pmatrix}\cos\theta+2\sin\theta & 2\cos\theta-\sin\theta\\ \sin\theta & \cos\theta\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}x\cos\theta+2x\sin\theta-y\sin\theta+2y\cos\theta\\ x\sin\theta+y\cos\theta\end{pmatrix}$
	$x\sin\theta+y\cos\theta=y$ AND $x\cos\theta+2x\sin\theta-y\sin\theta+2y\cos\theta=x$ $\Rightarrow x\cos\theta+2x\sin\theta+\dfrac{x\sin\theta}{1-\cos\theta}(2\cos\theta-\sin\theta)=x$
	$(\cos\theta+2\sin\theta)(1-\cos\theta)+2\sin\theta\cos\theta-\sin^2\theta=1-\cos\theta$ $\cos\theta-\cos^2\theta+2\sin\theta-\sin^2\theta=1-\cos\theta\Rightarrow\sin\theta+\cos\theta=1$
	$\theta=\frac{1}{2}\pi$

1(a)	$\begin{pmatrix}14 & 0\\ 0 & 1\end{pmatrix}$
	$\begin{pmatrix}\frac{1}{2} & -\frac{\sqrt{3}}{2}\\ \frac{\sqrt{3}}{2} & \frac{1}{2}\end{pmatrix}$
	$\mathbf{M}=\begin{pmatrix}\frac{1}{2} & -\frac{\sqrt{3}}{2}\\ \frac{\sqrt{3}}{2} & \frac{1}{2}\end{pmatrix}\begin{pmatrix}14 & 0\\ 0 & 1\end{pmatrix}=\begin{pmatrix}7 & -\frac{\sqrt{3}}{2}\\ 7\sqrt{3} & \frac{1}{2}\end{pmatrix}$
	$2\mathbf{M}=\begin{pmatrix}14 & -\sqrt{3}\\ 14\sqrt{3} & 1\end{pmatrix}.$

1(b)	$\begin{pmatrix}7 & -\frac{\sqrt{3}}{2}\\ 7\sqrt{3} & \frac{1}{2}\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}7x-\frac{\sqrt{3}}{2}y\\ 7\sqrt{3}x+\frac{1}{2}y\end{pmatrix}$
	$7\sqrt{3}x+\frac{1}{2}mx=m\left(7x-\frac{\sqrt{3}}{2}mx\right)$ $7\sqrt{3}+\frac{1}{2}m=7m-\dfrac{\sqrt{3}}{2}m^2$
	$\sqrt{3}m^2-13m+14\sqrt{3}=0$
	$m=2\sqrt{3}\quad m=\dfrac{7}{\sqrt{3}}$
	$y=2\sqrt{3}x\quad y=\frac{7}{\sqrt{3}}x$
1(c)	$\mathbf{M}^{-1}=\frac{1}{14}\begin{pmatrix}\frac{1}{2} & \frac{\sqrt{3}}{2}\\ -7\sqrt{3} & 7\end{pmatrix}=\frac{1}{2}\begin{pmatrix}\frac{1}{14} & \frac{\sqrt{3}}{14}\\ -\sqrt{3} & 1\end{pmatrix}$