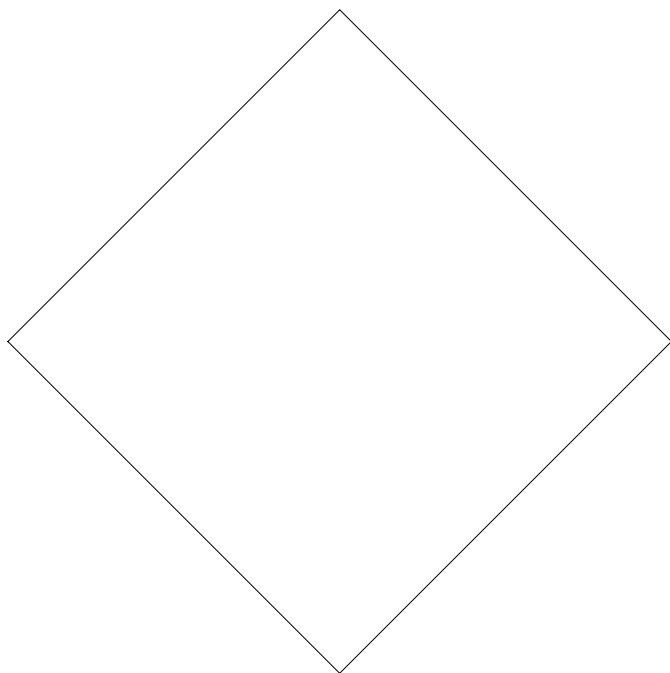


Answer for 6(a)

In[1]:= **Graphics**[**Line**[**{{0, 0}, {1, 1}, {2, 0}, {1, -1}, {0, 0}}**]]

Out[1]=



In[2]:= **Solve**[**{u == x - y, v == x + y}, {x, y}**]

Out[2]=  $\left\{ \left\{ x \rightarrow \frac{u+v}{2}, y \rightarrow \frac{1}{2} (-u+v) \right\} \right\}$

$$x = \frac{u+v}{2};$$

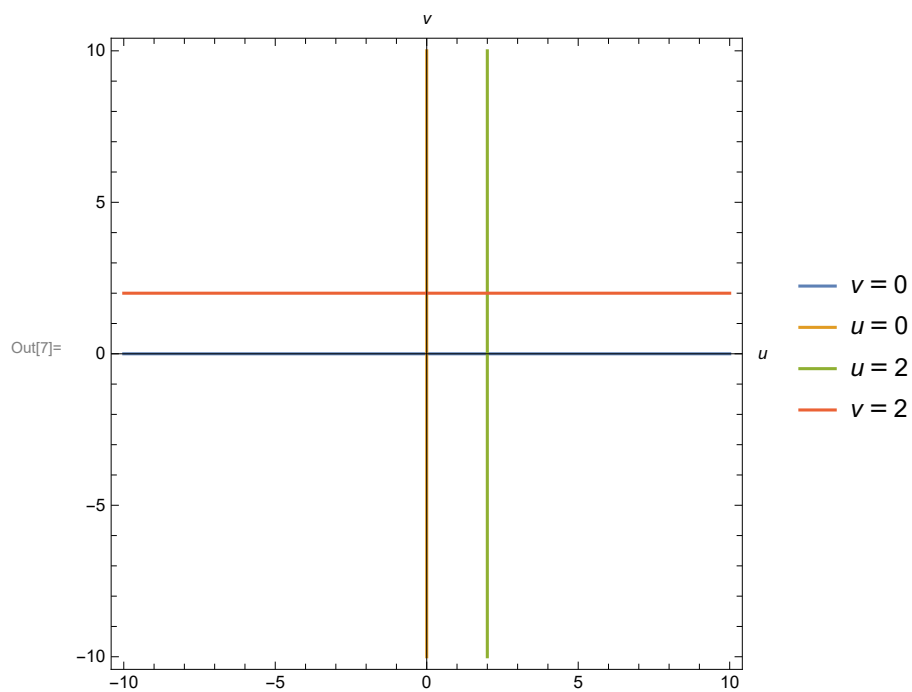
$$y = \frac{1}{2} (-u+v);$$

**(0, 0), (1, 1), (2, 0), (1, -1)**

In[6]:= **Simplify**[**Solve**[ $\frac{y-y1}{x-x1} == \frac{y2-y1}{x2-x1}$ , **v**] /. **{x1 -> 0, y1 -> 0, x2 -> 1, y2 -> -1}**]

Out[6]=  $\left\{ \left\{ v \rightarrow 0 \right\} \right\}$

```
In[7]:= plot = ContourPlot[{v == 0, u == 0, u == 2, v == 2}, {u, -10, 10},
  {v, -10, 10}, Axes → True, AxesLabel → Automatic, PlotLegends → "Expressions"]
```



Answer for 6(b)

```
In[8]:= jac = Det[D[{x, y}, {{u, v}}]]
```

Out[8]=  $\frac{1}{2}$

Answer for 6(c)

```
In[9]:= Integrate[x y (jac) dv du, {u, 0, 2}, {v, 0, 2}]
```

Out[9]= 0