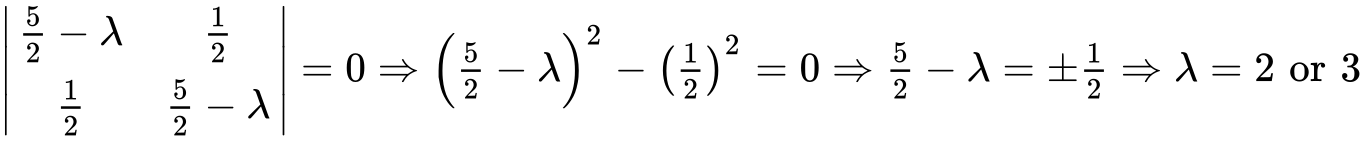
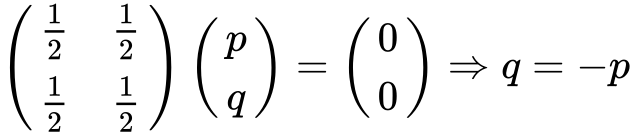
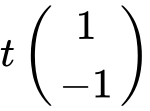
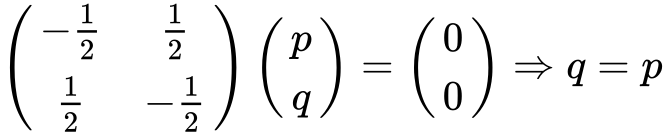
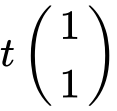
# 1.Numbers and algebra\_P\_3\_MS

**1a.** *[8 marks]*

## Markscheme

      ***M1M1A1A1***

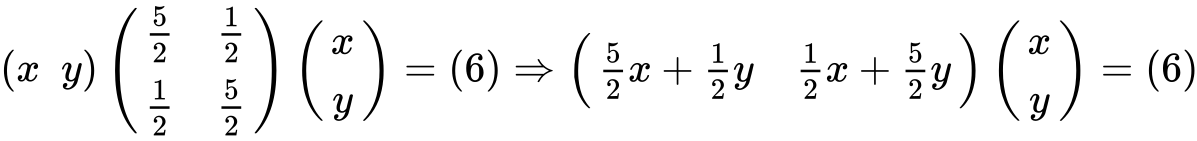
           eigenvalues are of the form       ***M1A1***

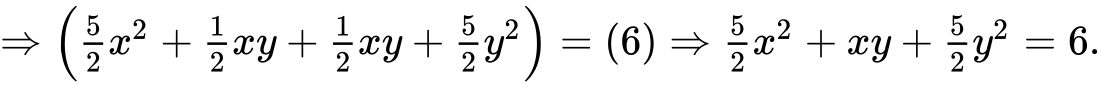
          eigenvalues are of the form       ***M1A1***

***[8 marks]***

**1b.** *[2 marks]*

## Markscheme

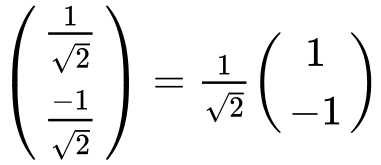
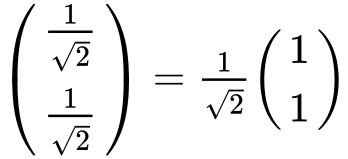
      ***M1A1***

       ***AG***

***[2 marks]***

**1c.** *[2 marks]*

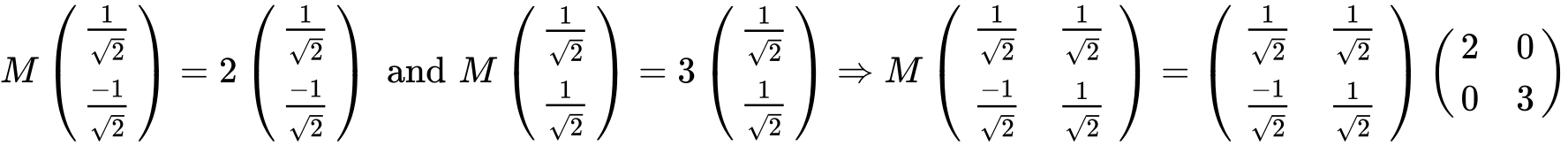
## Markscheme

 corresponding to ,      corresponding to       ***R1R1***

***[2 marks]***

**1d.** *[1 mark]*

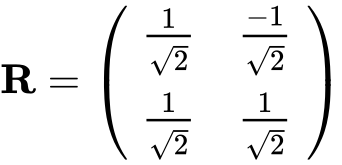
## Markscheme

      ***A1AG***

***[1 mark]***

**1e.** *[2 marks]*

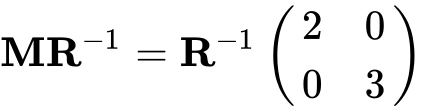
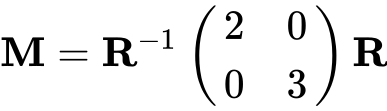
## Markscheme

Determinant is 1.           ***M1A1***

***[2 marks]***

**1f.** *[1 mark]*

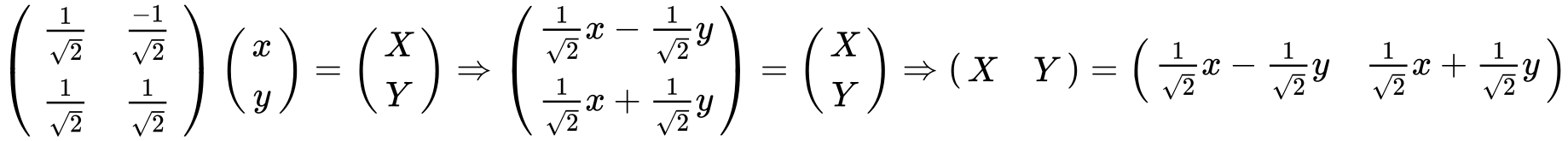
## Markscheme

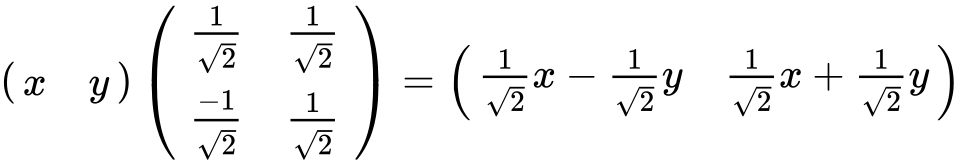
 so post multiplying by  gives        ***M1AG***

***[1 mark]***

**1g.** *[3 marks]*

## Markscheme

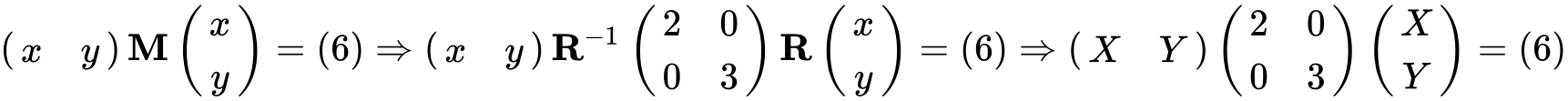
         ***M1A1***

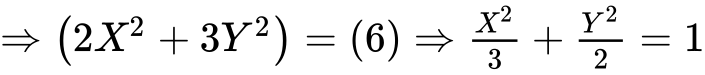
and  completing the proof       ***A1AG***

***[3 marks]***

**1h.** *[2 marks]*

## Markscheme

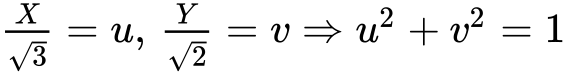


       ***M1A1***

***[2 marks]***

**1i.** *[2 marks]*

## Markscheme

, a circle (centre at the origin radius of 1)     ***A1A1***

***[2 marks]***

**1j.** *[2 marks]*

## Markscheme

A rotation about the origin through an angle of 45° anticlockwise.    ***A1A1***

***[2 marks]***

**1k.** *[2 marks]*

## Markscheme

an ellipse, since the matrix represents a vertical and a horizontal stretch    ***R1A1***

***[2 marks]***

**1l.** *[1 mark]*

## Markscheme

an ellipse      ***A1***

***[1 mark]***

**1m.** *[2 marks]*

## Markscheme

,       ***A1A1***

***[2 marks]***