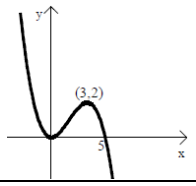
111 A function f is defined on a suitable domain by $f(x) = \frac{x+2}{x^2-7x+12}$. What value(s) of x cannot be in this domain?	
112 The graph of $y = f(x)$ is shown . Sketch the graphs of $y = -f(x)$ and $y = -f(x) + 3$. 	
113 The point Q divides the line joining $P(-1,-1,0)$ to $R(5,2,-3)$ in the ratio $2:1$. Find the coordinates of Q.	
114 If $\boldsymbol{u} = \begin{pmatrix} -3 \\ 1 \\ 2t \end{pmatrix}$ and $\boldsymbol{v} = \begin{pmatrix} 1 \\ t \\ -1 \end{pmatrix}$ are perpendicular, what is the value of t?	
115 Prove the identity: $2cos^2x - 1 = 1 - 2sin^2x$	
116 A line makes an angle of $45°$ with the positive direction of the *x*-axis. What is its gradient?	
117 Triangle ABC has vertices $A(-1,6)$, $B(-3,-2)$ and $C(5,2)$. Find the equation of the line q, the perpendicular bisector of BC.	
118 The point P(2, 3) lies on the circle $(x+1)^2 + (y-1)^2 = 13$. Find the equation of the tangent at P.	
119 A sequence is defined by the recurrence relation $u_{n+1} = \frac{1}{3}u_n + 1$, with $u_2 = 15$. What is the value of u_4?	
120 Calculate the area enclosed between the curves $y = x^2 - x + 3$ *and* $y = 3 + 2x - x^2$.