

Sheet1

Q Part			
1 a)	Gradient of paralel line between two points	$m = -\frac{5}{3}$	$m = \frac{y - y_1}{x - x_1}$
b)	Find coordinates of B (simultaneous equations)	$B(-3, 4)$	
c)	Find a constant K, given that it is on a line	$K = -30$	

2 a)	Simplify $(3\sqrt{5})^2$	45	$(3\sqrt{5})^2 = 3\sqrt{5} \cdot 3\sqrt{5} = 3 \cdot 3 \cdot \sqrt{5} \cdot \sqrt{5} = 9 \cdot 5 = 45$
b)	Rationalise the demoninator of $\frac{(3\sqrt{5})^2 + 5}{7 + 3\sqrt{5}}$	$75 - 32\sqrt{5}$	$\frac{(3\sqrt{5})^2 + 5}{7 + 3\sqrt{5}} \times \frac{7 - 3\sqrt{5}}{7 - 3\sqrt{5}} = \frac{((3\sqrt{5})^2 + 5) \times (7 - 3\sqrt{5})}{(7 + 3\sqrt{5}) \times (7 - 3\sqrt{5})}$ $\frac{300 - 128\sqrt{5}}{4} = 75 - 32\sqrt{5}$

3 a)	Complete the square of $x^2 - 7x + 2$	$y = \left(x - \frac{7}{2}\right)^2 - \frac{41}{4}$	$\left(x - \frac{7}{2}\right)^2 + 2 - \frac{49}{4} = \left(x - \frac{7}{2}\right)^2 + \frac{8}{4} - \frac{49}{4} = \left(x - \frac{7}{2}\right)^2 - \frac{41}{4}$
b)	Min value?	$-\frac{41}{4}$	
c)	Translation of	$\begin{bmatrix} 1/2 \\ 41/4 \end{bmatrix}$	

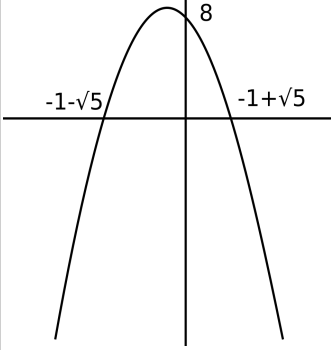
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4 a)	Show that $(x+3)$ is a factor of $x^3-5x^2-8x+48$	As $p(-3)=0$, $(x+3)$ is a factor	$-3^3-5 \times -3^2-8 \times -3+48=-27-45+24+48=0$
b)	Express $x^3-5x^2-8x+48$ as a product of three linear factors	$(x+3)(x-4)(x-4)$	$ \begin{array}{r} x^2-8x+16 \\ (x+3) \overline{) x^3-5x^2-8x+48} \\ \underline{x^3+3x^2} \\ -8x^2-8x \\ \underline{-8x^2-24x} \\ 16x+48 \\ \underline{16x+48} \\ 0 \end{array} $
c)	Use the Remainder Theorem to find the remainder when $(x-2)(x^2+bx+c)$ is divided by $(x-2)$	$R=20$	$2^3-5 \times 2^2-8 \times 2+48=8-20+-16+48=20$
d)	Express $x^3-5x^2-8x+48$ in the form $(x-2)(x^2+bx+c)+r$	$(x-2)(x^2-3x-14)+20$	$ \begin{array}{r} x^2-3x-14 \\ (x-2) \overline{) x^3-5x^2-8x+48} \\ \underline{x^3-2x^2} \\ -3x^2-8x \\ \underline{-3x^2+6x} \\ -14x+48 \\ \underline{-14x+28} \\ 20 \end{array} $

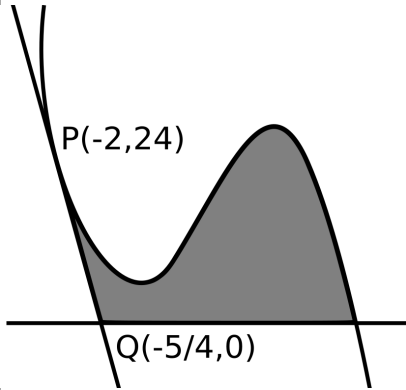
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5 a)	Equation of circle given Centre and point on edge.	$(x-5)^2+(y+3)^2=65$	$C(5, -3), A(-2, 1)$ $(x-5)^2+(y+3)^2=K$ $(-2-5)^2+(1+3)^2=K$ Sub in A for x and y $49+16=K$ $65=K$
b)	Find coordinates of B if AB is a diameter	$B(12, -7)$	From A to C: $\Delta y=7, \Delta x=-4$ From C to B will be the same as C is a mid point. Therefore $B(5+7, -3-4), B(12, -7)$
c)	Equation of tangent at A	$7x-4y+18=0$ (in this form)	$CA=\sqrt{65}, AT=4$
d)	Length of CT	$CT=9$	$CT^2=\sqrt{65}^2 4^2=81$ $CT=9$

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6 a)	?		What are these questions? Tangent involved?
b)	?		
c)	Draw the graph	 A graph of a downward-opening parabola on a Cartesian coordinate system. The x-axis is labeled with the roots $-1-\sqrt{5}$ and $-1+\sqrt{5}$. The y-axis is labeled with the y-intercept 8.	Do these need reversing???
d)	Find the roots	$1 \pm \sqrt{5}$	

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7 a)	Find the equation of the tangent at P(-2,24)	$y = -32x - 40$	
b)	Find the x-coordinate of Q, the x intercept of the tangent.	$Q(-\frac{5}{4}, 0)$	$0 = -32x - 40$ $40 = -32x$ $5 = -4x$ $\frac{5}{-4} = x$ $x = -\frac{5}{4}$
c)	Solve this integral $\int_{-2}^1 4 - x^2 - 3x^3$	$\frac{81}{4}$	$\left[\frac{-3x^4}{4} - \frac{x^3}{3} + 4x + c \right]_{-2}^1$
d)	Find the shaded area 	Area of Triangle = $\frac{24 \cdot (-\frac{5}{4} - -2)}{2} = 9$ Shaded area = $\frac{81}{4} - 9 = \frac{45}{4}$ (OE)	
8 a)	???	$k > 6$ and $k < -\frac{3}{2}$	