Perth Modern

Mathematics Department

S je∍T	Year 11	spoq	Course Me
N SCHOOL		Except	MODEL SHOW

Special items:	Drawing instruments.	
Standard items:	Pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters	
Materials required:	Formula Sheet and 1 page both sides of notes permitted. No Calculators allowed.	
Number of questions:	S	
Time allowed for this tasl	snim 04 ::	
Task type:	gesbouse	
Student name:	Теасһет пате:	

Note: All part questions worth more than 2 marks require working to obtain full marks.

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% ΟΤ

32 marks

Formula sheet provided: Yes

Task weighting:

Marks available:

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Question 1 (1.1.8) (4 marks)

A parabola that has its vertex at the point with coordinates (-1, 6) passes through the point (2, 10).

Find the equation of the parabola.

e equation of the parabola.  

$$y = a(x+1)^{2} + 6$$
i.e.  $10 = a(2+1)^{2} + 6$ 

$$4 = 9a$$

$$a = \frac{4}{9}$$

$$y = \frac{4}{9}(x+1)^{2} + 6$$

$$y = \frac{4}{9}(x+1)^{2} + 6$$

Question 2 (1.1.10) (4 marks)

Find the exact y-coordinate of the points of intersection of the curve with equation

$$y = x^2$$
 and the circle  $x^2 + y^2 = 1$ 

Answer  $y = \frac{\sqrt{5}-1}{2}$  recognises that we have only 1 solution (-1)

$$y^{2} + y^{2} = 1$$

$$y^{2} + y - 1 = 0$$

$$y = \frac{-1 \pm \sqrt{1^{2} - 4(1)(1)}}{2(1)}$$

$$= \frac{-1 \pm \sqrt{1 + 4}}{2}$$

$$= \frac{-1 + \sqrt{5}}{2}$$

$$= \frac{-1 + \sqrt{5}}{2}$$

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(3, 2, = 5 marks)

Question 3 (1.1.11)

Consider the quadratic equation  $(-2p + 1)x^2 + (p - 2) + 6p = 0$ .

- Be write the discriminant in perfect square form.

  Re write the discriminant in perfect square form.

(2, 2 = 4 marks)

Question 4 (1.1.24)

Given function f with rule  $f(x) = \sqrt{3}x - 11$ 

(a) State the domain of 
$$f(x)$$
  $3x-11 \ge 0$   
 $\frac{1}{\xi} \le x$   $\frac{1}{\xi} \le x$ 

(b) Find f(2a+3)

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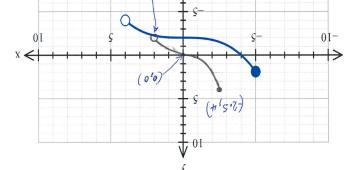
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Question 8

(1, 2, 2 = 5 marks)

(S marks)

The function y = f(x) is shown below.



(a) State the range of f(x).  $\left\{ -4 < y \le 2 \right\}$  (1 mark)

(b) Another function is given by g(x) = 2f(x-3).

Describe the transformation required to produce g(x) from f(x).

Transformation required to produce g(x) from f(x).

Translation fix), 3 worts to the Kight, then

(c) On the same axes above, sketch the graph of y = f(2x) + 2.

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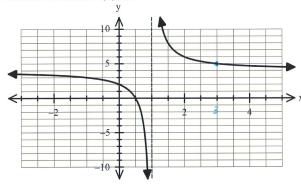
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Question 5 (1.1.14) (4 marks)

Given that the graph below is in the form  $y = \frac{a}{r-h} + c$ Determine the values of a, b, and c

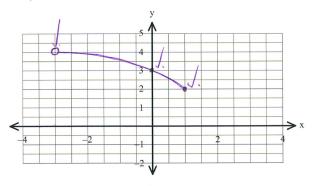


$$y = \frac{a}{x-1} + 4$$
, then (3,5)  
 $a = 2$   
 $a = 2$   
 $a = 2$   
 $a = 2$   
 $a = 2$ 

(1.1.15)Question 6

(3 marks)

Sketch  $y = \sqrt{-x+1} + 2$  within the domain  $-3 < x \le 3$ 



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Question 7 (1.1.21, 1.1.22)

(2, 4 = 6 marks)

Consider the Polynomial  $G(m) = m^3 - 3m^2 - 6m + 8$ 

- (a) Find G(4) $= 4^{3} - 3(4)^{2} - 6x4 + 8\sqrt{.}$ = 0 \ .: m-4 15 a factor.
- (b) Hence or otherwise fully factorise G(m)can use any method
  eg tral ±1,2,3 / long division

$$(m-4)(m^2+m-2) = G(m)$$

$$(m-4)(m+2)(m-1) = G(m)$$

$$\frac{m^2 + m - 2}{m^3 - 3m^2 - 6m + 8}$$

$$\frac{m^2 + m - 2}{m^3 - 4m^2}$$

$$\frac{m^2 - 6m + 8}{m^2 - 4m}$$

$$\frac{m^2 - 6m + 8}{m^2 - 4m}$$

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