ALL SAINTS' COLLEGE

MATHEMATICS DEPARTMENT

Year 11 Methods - Test Number 2 2020 Functions

Resource Free

Name: _____ Teacher: _____

Marks: 37

Reading Time: 3 minutes

Working Time: 25 minutes

Instructions: You ARE NOT permitted any notes or calculators.

The formula sheet will be provided.

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Question 1 **[2, 2 = 4 marks]**

Solve the following equations:

a) $3x^2 - 12x = 0$

b) $x^2 - 11x = 60$

Question 2 **[3 marks]**

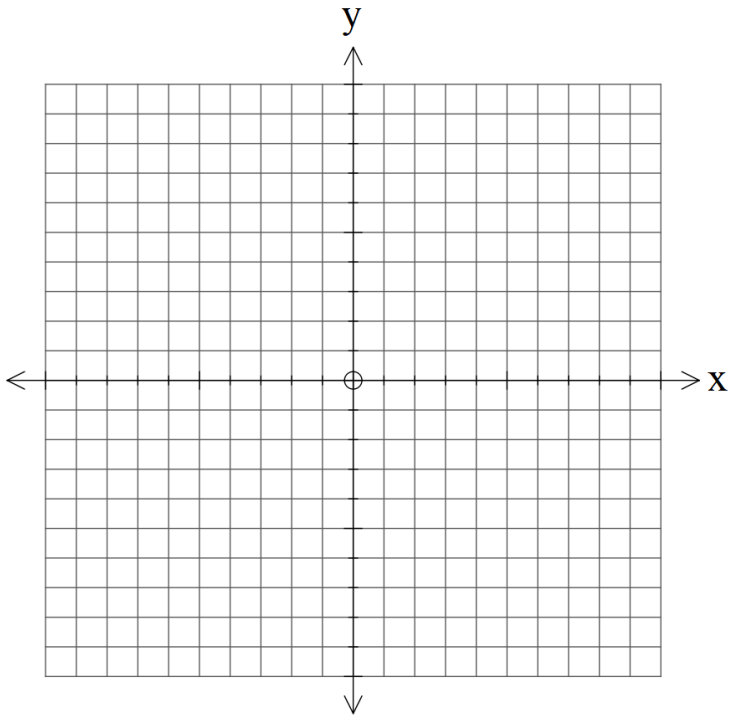
Find, in the form $y = ax^2 + bx + c$, the equation of the quadratic whose graph:

a) Touches the x-axis only at 4 and passes through (2, 12)

Question 3 **[2, 2 = 4 marks]**

a) Write the quadratic $y = x^2 + 4x - 3$ in the form $y = a(x - h)^2 + k$

b) Hence, sketch the graph of $y = x^2 + 4x - 3$



Question 4 **[2 marks]**

Find the values of k for which $2x^2 - 12x + k = 0$ has a repeated root.

Question 5 **[1, 3 = 4 marks]**

Given A has coordinates (6,7) and the midpoint of AB is (9, -2)

a) Determine the coordinates of B

b) Determine the equation of the line perpendicular to AB and going through point (5,2)

Question 6 **[1, 1, 3 = 5 marks]**

If $f(x) = 2x - x^2$ and $g(x) = 3x - 4$

a) Evaluate $f(2)$

b) Show that $g(b + 2) = 3b + 2$

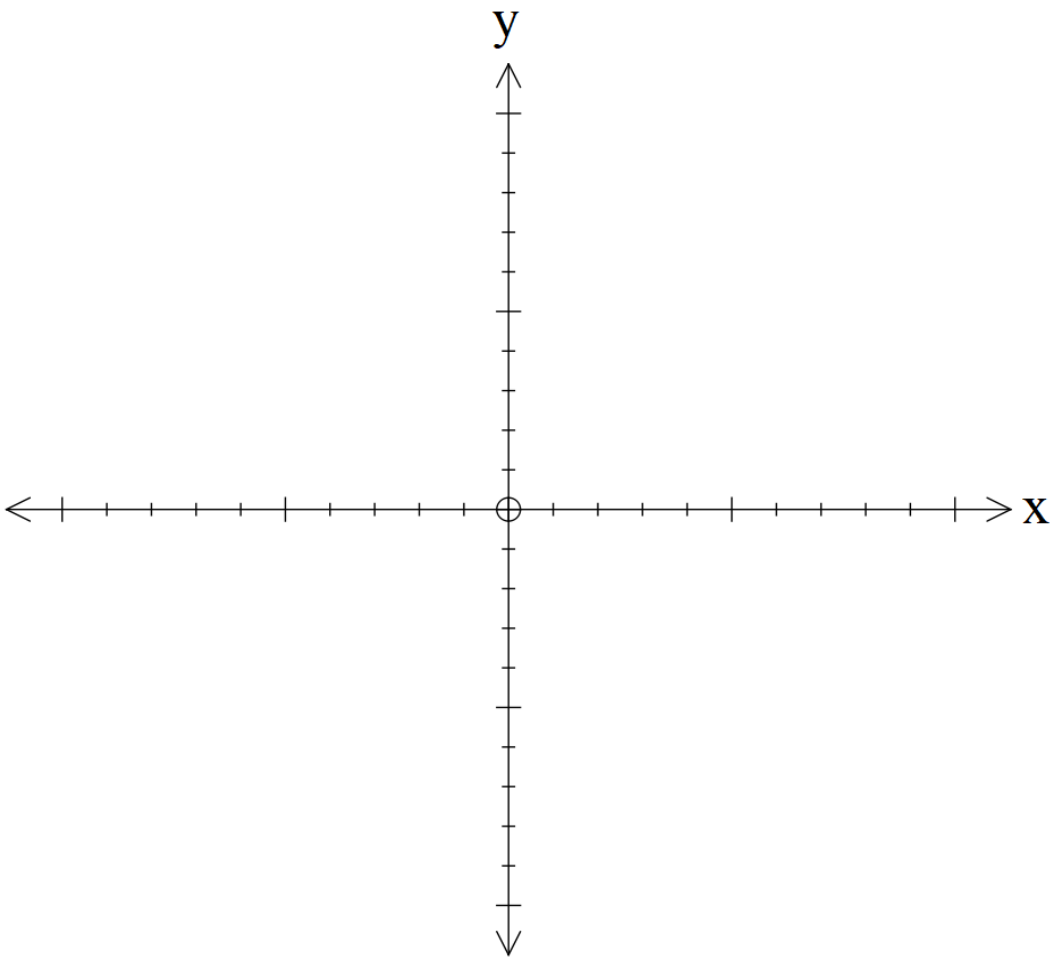
c) Determine the values of b such that $f(b) = g(b)$

Question 7 **[1, 4, 2 = 7 marks]**

a) Show that -2 is an x-intercept of the graphs of $f(x) = 3x^3 - 5x^2 - 42x - 40$

b) Find any other x-intercepts

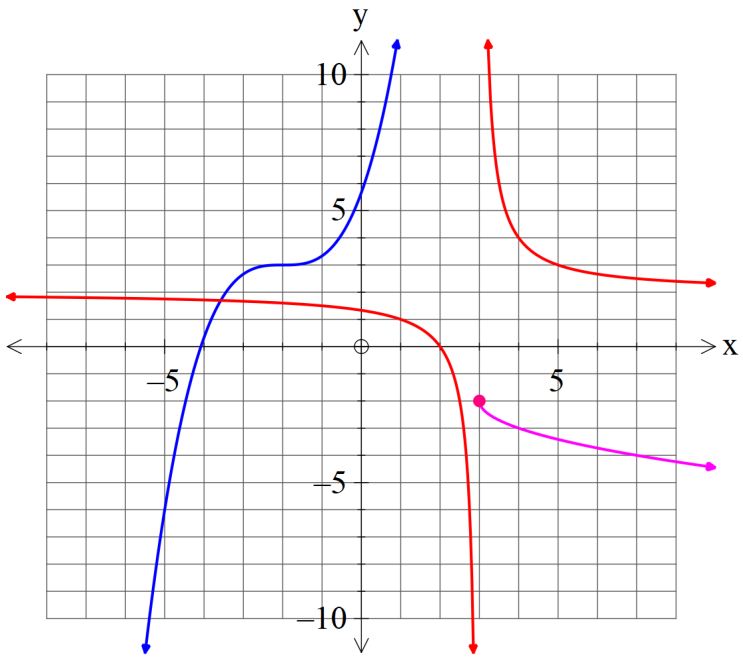
c) Using the information from part b) sketch the graph $f(x) = 3x^3 - 5x^2 - 42x - 40$



Question 7 **[6, 1, 1 = 8 marks]**

The three equations given below are for the three graphs shown below.

a) Determine the values of the constants a, b, c, d, e and f



$f(x) = a(x-b)^3 + 3$ $g(x) = c\sqrt{x-3} + d$ $h(x) = \dfrac{1}{x-e} + f$

b) State the natural domain of g(x)

c) State the range of h(x)

End of Resource Free Test