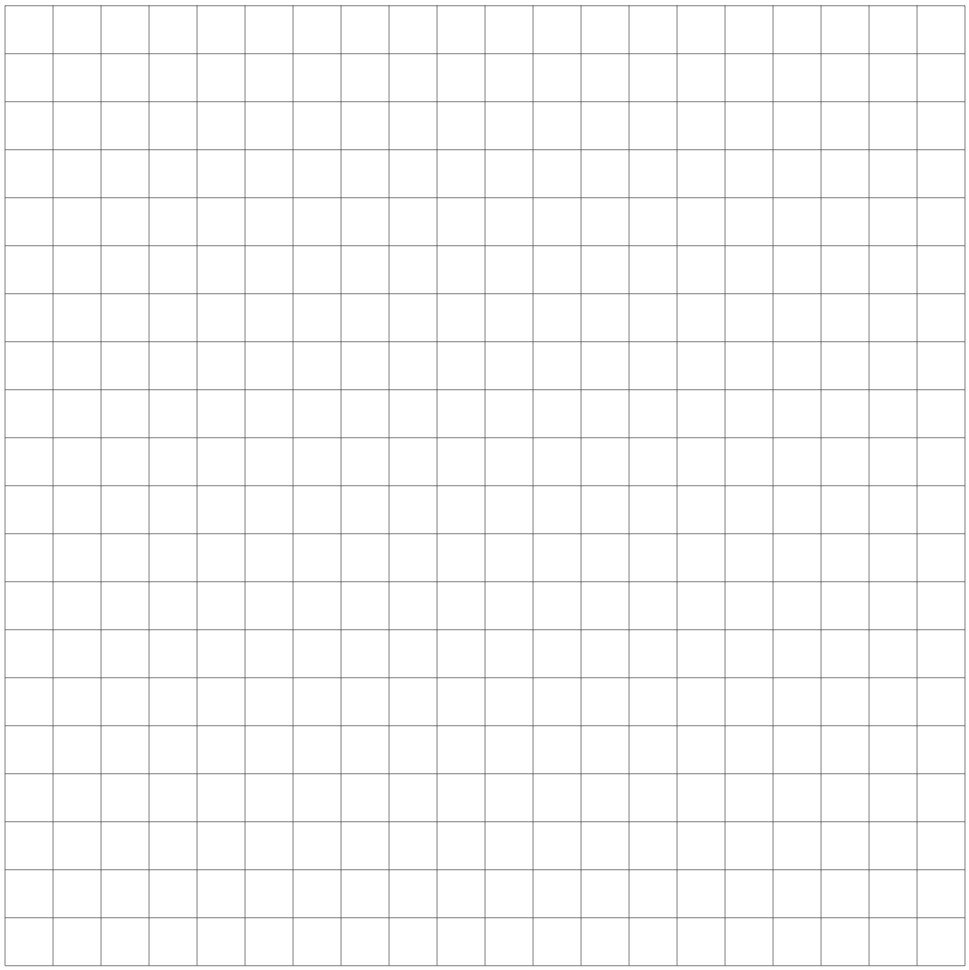
16 March 2018 Name: .

Regents practice: Polynomial functions and graphs

Graph carefully using pencil

Practice problems

1. The zeros of a cubic polynomial function f are $-5, 2,$ and 6. Sketch a graph of $y = f(x)$ on the grid below.



Write an equation for $f(x)$.

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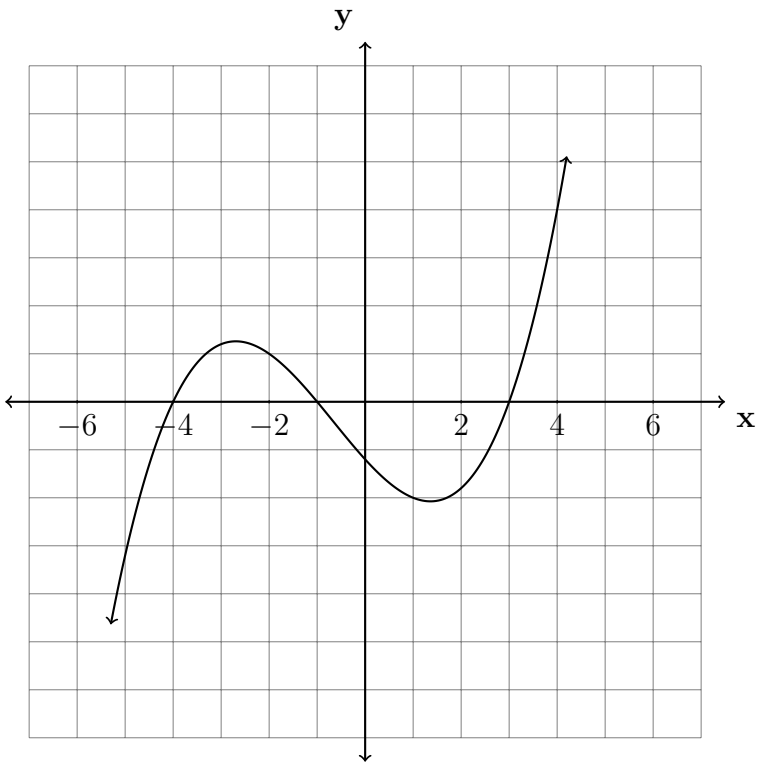
2. The graph of $y = f(x)$ is shown below. The function has a leading coefficient of 1.



Write an equation for $f(x)$.

The function g is formed by translating function f left 3 units. Sketch $y = g(x)$ on the same grid.

Write an equation for $g(x)$.

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3. Given that $x - 2$ is a factor of $f(x) = 3x^3 - 9x^2 + 8x - 4$. What is the value of $f(2)$?

4. What is the quotient when $x^2 - 3x - 40$ is divided by $x + 5$?

5. Algebraically determine the values of h and k to correctly complete the identity stated below.

$$10x^2 - 11x - 7 = (x - 2)(hx + 9) + k$$

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6. Given: $f(x) = x^2 + x - 2$ and $g(x) = x - 1$

   Express $2x \times g(x) - f(x)$ as a polynomial in standard form.

7. Simplify the expression $\dfrac{4x^3 + 9x - 5}{2x - 1}$, where $x \neq \frac{1}{2}$.

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8. Given the function $f(x) = x^3 - 5x^2 - 4x + 20$.

   (a) Find the zeros of f.

   (b) Write down $f(x)$ in factored form.

   (c) Graph the function on the grid below, carefully passing through the correct $x-$ and y-intercepts.