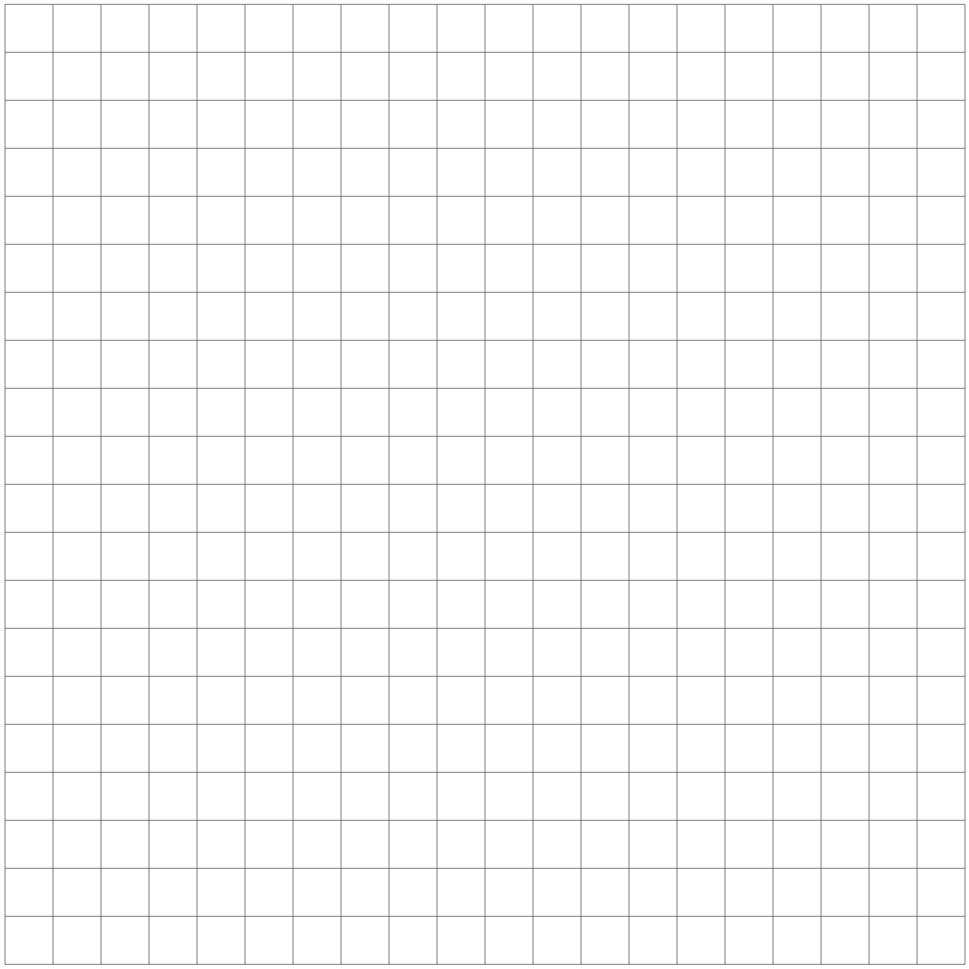
18 March 2018 Name: .

Classwork: Polynomial functions and graphs

Graph carefully using pencil

1. The zeros of a quartic polynomial function f are $-5, 0, 2,$ and 7. The polynomial has a positive leading coefficient, $a > 0$. Sketch a graph of $y = f(x)$ on the grid below.



Write an equation for $f(x)$ in factored form, assuming the leading coefficient is one.

Express the function in standard form. Check that the y-intercept on your graph is correct.

18 March 2018 Name: .

Classwork: Polynomial functions and graphs

2. Given that the remainder when $f(x) = 3x^3 - 9x^2 + 8x - 20$ is divided by $x - 3$ is 4. What is the value of $f(3)$?

3. What is the quotient when $3x^2 - 9x - 12$ is divided by $x + 2$?

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

$$2x^3 - 3x^2 + 7x + 3 = (x - 2)(hx^2 + x + 9) + k$$

18 March 2018 Name: .
Classwork: Polynomial functions and graphs

5. Given: $f(x) = x^2 + 3x - 2$ and $g(x) = 2x + 3$
   Express $f(x) \times g(x)$ as a polynomial in standard form.

6. Simplify the expression $\dfrac{6x^3 + 9x^2 - 5x - 4}{2x + 1}$, where $x \neq -\frac{1}{2}$.

Classwork: Polynomial functions and graphs

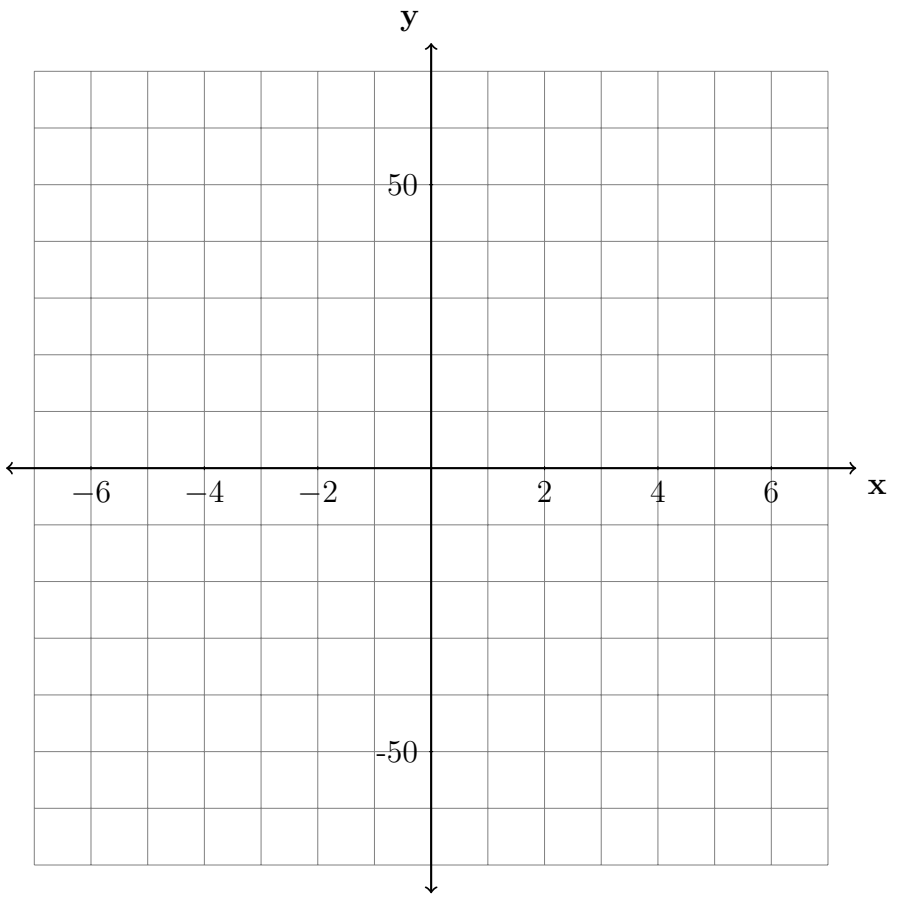
7. Given the function $f(x) = x^3 - 4x^2 - 4x - 7$.

(a) Using the calculator table function, complete the y values.

x	f(x)
−4	
−3	
−2	
−1	
0	
1	
2	
3	
4	
5	

(b) Graph the function on the grid below.

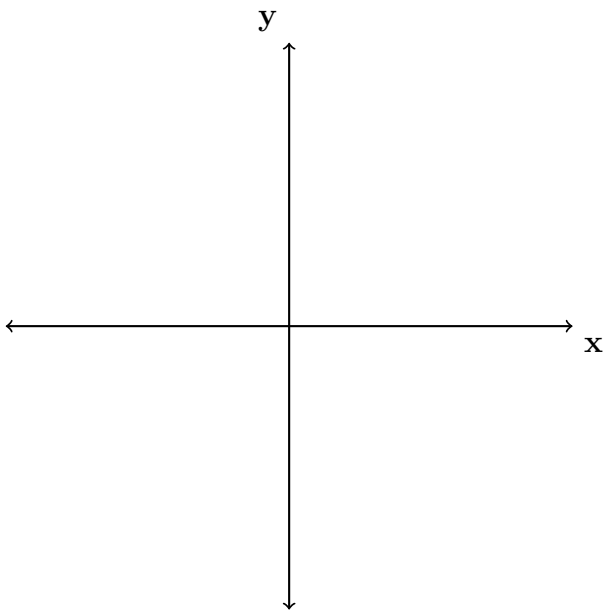
(c) Using the calculator graph-solve function, find the roots of the function, rounded to the *nearest hundredth*.



Classwork: Polynomial functions and graphs

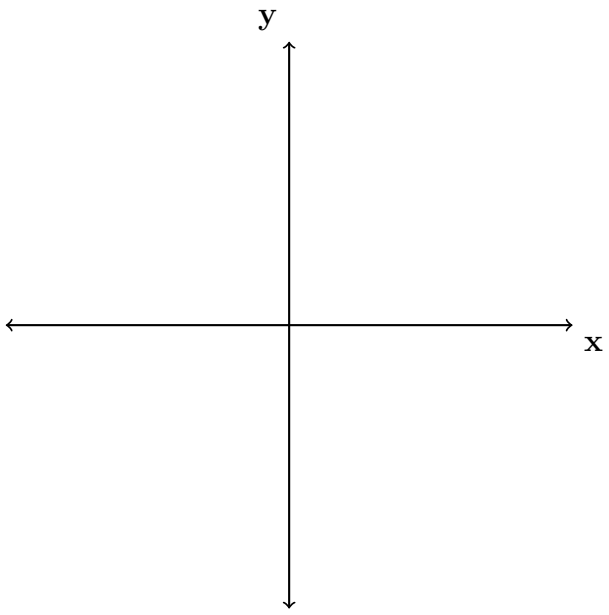
8. Sketch a graph with the following characteristics:

   - three real zeros
   - as $x \to +\infty$, $f(x) \to -\infty$
   - as $x \to -\infty$, $f(x) \to +\infty$



9. Sketch a graph with the following characteristics:

   - polynomial function of order four
   - a positive leading coefficient
   - four real zeros



Classwork: Polynomial functions and graphs

10. For each polynomial graph, state
    (a) its degree,
    (b) how many distinct zeros it has, and
    (c) the sign of its leading coefficient.