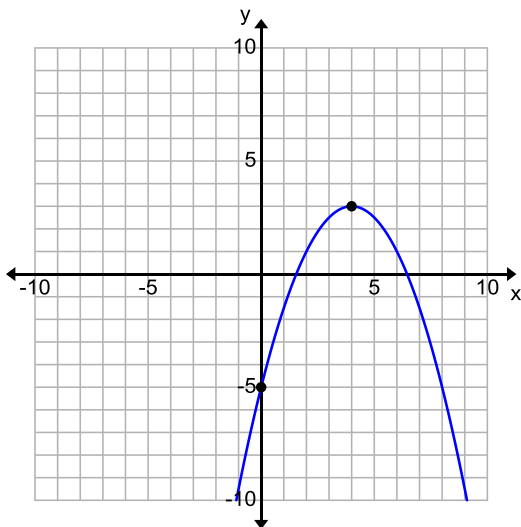


1. Divide $(2x^3 + 3x^2 - 39x - 20)$ by $(x + 5)$ using synthetic division
2. Divide $(x^4 - x^3 - 3x + 14)$ by $(x - 2)$ using synthetic division
3. Divide $(3x^4 + 8x^3 + 1x^2 + 7x - 6)$ by $(x^2 - 2x + 3)$
4. Find the equation of the parabola in standard form that has a vertex of $(-5, -1)$ and goes through the point $(-8, -37)$
5. Find the axis of symmetry for $f(x) = -3(x - 7)^2 + 2$
6. Find the axis of symmetry for $f(x) = -x^2 - 8x + 5$
7. Describe the end behavior, leading coefficient and degree of $f(x)$ for $f(x) = 2x^5 - 3x^6 + 5x^2 - 7$
8. Factor to find all of the real zeros and determine their multiplicity in $f(x) = 2x^4 - 14x^3 + 20x^2$
9. Sketch a graph of the function $f(x) = -x^2(x + 2)(x - 3)^3$ by a) finding the zeros, b) determining multiplicity, and c) applying the leading coefficient test
10. Find the equation of a polynomial function that has the given zeros 0, 5, -7
11. List the transformations and sketch $f(x) = 2(x + 1)^2 - 5$
12. List all of the possible rational roots of $f(x) = 4x^5 + 7x^2 - 9x + 30$.
13. Use synthetic division to evaluate $x = 7$ when $f(x) = x^4 - 3x^3 + 2x^2 - 6x - 5$
14. Given $f(x) = 2x^4 + 5x^3 - 36x^2 - 41x + 70$ and that $(x + 5)$ and $(x + 2)$ are factors completely factor $f(x)$
15. Solve the following for x by factoring completely. $x^4 - x^3 + 13x^2 - 25x - 300 = 0$ (**hint: graphing calculator and synthetic division**)
16. If $x = -1$ is a root of $f(x) = x^3 + 4x^2 - x - 4$, use synthetic division to factor the polynomial completely.
17. Find all the zeros of the function
 - a. $f(x) = 3x(x - 2)(x + 1)^2$
 - b. $f(x) = x^2 + 7x - 18$
18. Find the equation of the parabola in standard form that has a vertex of $(3, 7)$ and goes through the point $(6, 43)$.
19. A dog walking company is trying to maximize their monthly profit. Their profit equation is $p(x) = -3x^2 + 762x - 140$. How many walks should they do per month? What is their max profit?
20. Given $y = x^2 - 4x - 60$ find the vertex and x-intercepts.
21. Find the equations of the graphs below:

a.



b.

