Complete Graphs

For each of the following functions, find a viewing rectangle that shows the important features of the graph. Find the domain and range, x and y intercepts, all asymptotes (horizontal, vertical and slant), local maximum and minimum values, the basic shape and end behavior. These functions have been carefully selected so that you will have to use your knowledge of the graphical properties of lines, quadratics, cubics, rational, trigonometric and exponential functions to be successful. Good luck!

1. $y = .002x + 436$

2. $y = \dfrac{3}{7} x + 0.1$

3. $f(x) = x^2 - 2x + 100$

4. $g(x) = \left| 99 + 2x - x^2 \right|$

5. $y = x^3 - 2x^2 + x - 30$

6. $f(x) = 2 - (x-1)^2$ compared to $g(x) = 2 - (x-1)^2 - \dfrac{1}{1000\sqrt[3]{x-1} + 1}$

7. $f(x) = x^4 + 8x^3 + 6x^2 - 8x - 3$

8. $g(x) = 2x^4 + 9x^3 + 9x^2 - 19x + 3$

9. $y = \dfrac{x+5}{x+15}$

10. $y = \dfrac{1}{|x - 20|}$

11. Formula for \$1000 compounded at 6% annually for x years: $y = 1000 \,(1.06)^x$

12. Logistic growth model: $P(x) = \dfrac{100}{1 + 99\, e^{-.2x}}$ where $P(x)$ is the population at time x.

13. $f(x) = \dfrac{x^3 - 7x - 6}{x^2 - 9}$

14. $g(x) = \dfrac{1}{3x^2 - 5x + 7}$ compared with $h(x) = \dfrac{1}{3x^2 - 5x - 7}$

15. Graph each of the following functions separately using the trig zoom option. What is going on?

what is the period

      a) $f(x) = \dfrac{\sec x}{\tan x + \cot x}$ b) $g(x) = \sin 49x$

compare $y = \cos(49x)$ w/ $y = \cos(48x)$

16. Graph each of the following functions separately using the trig zoom option. What is going on?

      a) $f(x) = -\sin x$ b) $g(x) = \sin 47x$

17. Find a viewing rectangle that shows one period of $f(x) = \sin x + \cos x$.

18. Find a viewing rectangle that shows one period of $f(x) = \sin 48x$.

For some functions, you may need to show the graph in different windows to demonstrate all the properties.

19. $f(x) = \dfrac{x^3 + x + 1}{x - 2}$

20. $g(x) = \dfrac{x^3 + 2x}{x - 2}$

21. Show the all intersection points for: $y = 4^x$ and $y = x^4$.

22. Show the all intersection points for: $y = x^2$ and $y = e^{0.1x}$.

23. $y = \dfrac{x - 6}{\sqrt[5]{x^4}}$

24. $f(x) = \dfrac{3x}{4x - 4\sin x}$ compared to $g(x) = \dfrac{3x}{4x - 4\sin x + .001}$