

So You Think You Can Succeed In Calculus

Do the following problems in your notebook, by yourself, and without a graphing calculator. Can't remember how to do them? Then, check out the resource page at our website <http://zendog.org/homework>

Factor the following polynomials:

- $x^3 - 27$ $(x - 3)(x^2 + 3x + 9)$
- $x^3 + 8$ $(x + 2)(x^2 - 2x + 4)$
- $x^3 - 4x^2 - 77x$ $x(x + 7)(x - 11)$

Simplify the following expressions:

- $\ln e^8 + \ln e + \ln 1$ 9
- $\tan^{-1}(1) + \sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$ $\frac{7\pi}{12}$
- $\sin\left(\frac{3\pi}{2}\right) + \cos\left(\frac{\pi}{3}\right)$ $-\frac{1}{2}$
- $\cos^2(\pi) + \sin^2(\pi)$ 1
- $\sqrt{x}\left(x^7 - x^{\frac{11}{2}} + \sqrt[3]{x}\right)$ $x^{\frac{15}{2}} - x^6 + x^{\frac{5}{6}}$
- $\frac{x^4 + 2x^2 + 1 + \sqrt{x}}{\sqrt[3]{x}}$ $x^{\frac{11}{3}} + 2x^{\frac{5}{3}} + x^{-\frac{1}{3}} + x^{\frac{1}{4}}$

Simplify and state the domain of the following expression:

- $\frac{x^3 - 64x}{x^2 + 7x - 8}$ $(-\infty, -8) \cup (-8, 1) \cup (1, \infty)$
 $= \frac{x(x+8)(x-8)}{(x+8)(x-1)}$
 $= \frac{x(x-8)}{x-1}$



Write an equation for the specified lines:

11. Through $(1, -6)$ with slope of 3

$$y + 6 = 3(x - 1)$$

12. Horizontal line through $(0, 3)$

$$y = 3$$

13. With slope -3 and y-intercept 3

$$y - 3 = -3(x - 0)$$

14. Through the points $(1, 4)$ and $(-7, -11)$

$$\textcircled{QR} \quad y + 11 = \frac{15}{8}(x + 7)$$

Graph the following functions on different sets of axes:

$$y - 4 = \frac{15}{8}(x - 1)$$

15. $f(x) = \ln x$

16. $v(t) = e^t$

17. $g(x) = \frac{1}{x}$

18. $s(t) = \frac{1}{t^2}$

19. $h(x) = |x|$

20. $a(t) = \begin{cases} -(t-2) & -4 \leq t \leq 2 \\ t-2 & 2 < t \leq 4 \end{cases}$

check
on
your
TI

