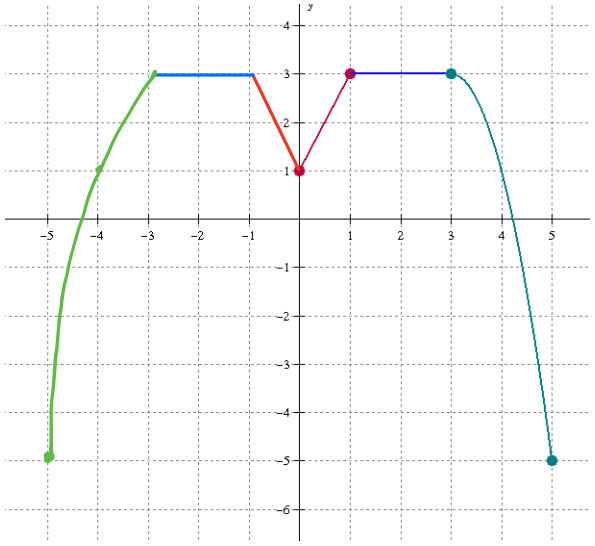
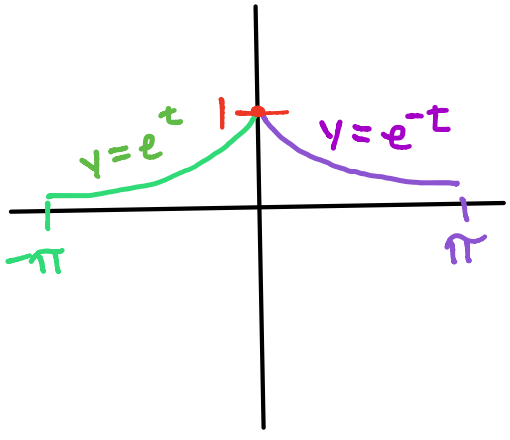
APPLICATION

| **Determine algebraically whether each function is even, odd, or neither. SHOW WORK!** | **Given that the $f(x)$ is continuous on (-5, 5) and even, draw the graph $f(x)$ from ~~(0,5)~~ (-5,0)** |
|---|---|
| 1. $f(x) = 1 - x - x^3$<br>~~ODD~~ $(-x,-y)$<br>$-f(-x) = 1-(-x)-(-x)^3$<br>$-f(-x) = 1+x+x^3$<br>$f(-x) = -1-x-x^3$<br>~~Even~~ $(-x,y)$<br>$f(-x) = 1-(-x)-(-x)^3$<br>$f(-x) = 1+x+x^3$<br>Neither | 2.<br>  |

3. Show that the piecewise function is odd or even. Don't be lame and just guess one. Justify your answer!!

$$f(t) = \begin{cases} e^t, & -\pi \le t < 0 \\ e^{-t}, & 0 \le t < \pi \end{cases}$$

DON'T FREAK OUT!!! Break down each part. You know what it all is, it just looks confusing. I left lots of room for your justification. You're welcome.




This graph is even because it is symmetric with the y-axis.

**For 4-9, use the piecewise function $g(x)$.**

$$g(x) = \begin{cases} -3x + 2, & 0 < x \le 2 \\ (x-2)^2 - 4, & 2 < x \le 4 \\ -1, & 4 < x \le 5 \end{cases}$$

4. Graph the $g(x)$ below.

5. Given that the function is odd from $[-5, 5]$, draw in the missing portion on the interval $[-5, 0)$

6. State the intervals where the function is continuous.

$[-5,-4) \cup [-4,0) \cup (0,4] \cup (4,5]$

7. Identify the points of discontinuity and label them removable, nonremovable jump, or nonremovable infinite.

Nonremovable Jump Disc @ $x = -4, 0, 4$

8. Write the equation of the piecewise function from $[-5, 0)$

$y = -3x + 2$
$-2 = -3x + 2$
$-4 = -3x$
$\frac{4}{3} = x$

$y = (x-2)^2 - 4$
$-2 = (x-2)^2 - 4$
$2 = (x-2)^2$
$\pm\sqrt{2} = x - 2$
$2 \pm \sqrt{2} = x$
$2 + \sqrt{2} = x$

$$g(x) = \begin{cases} 1, & -5 \le x < -4 \\ -(x+2)^2 + 4, & -4 \le x < -2 \\ -3x - 2, & -2 \le x < 0 \end{cases}$$

9. Find:

a. $g(4) =$ 0

b. $g(-5) =$ 1

c. Find $x$ if $g(x) = -2$ $x = \frac{4}{3}, 2+\sqrt{2}$

d. $y$-intercept = DNE

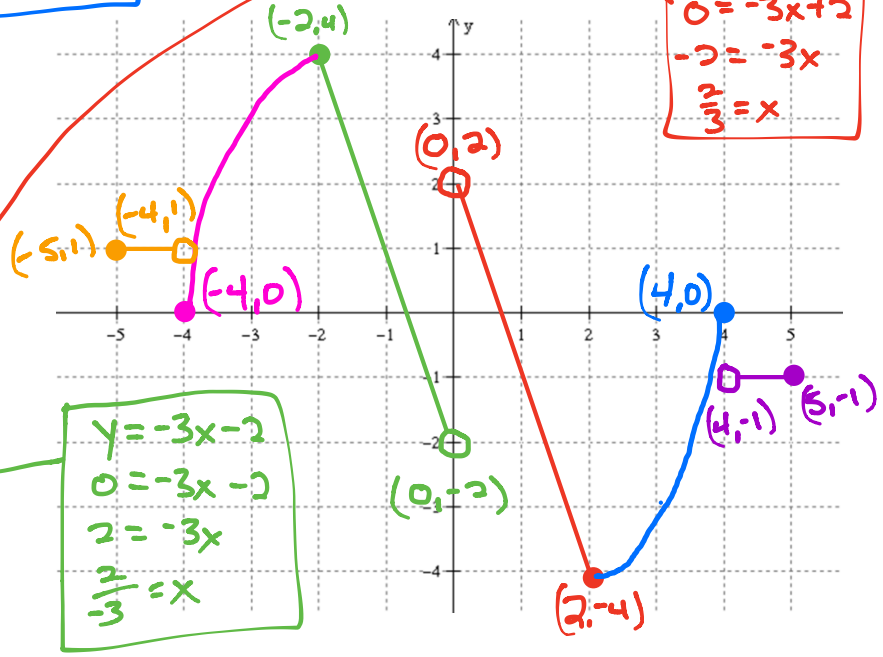
e. $x$-intercept(s) = $-4, -\frac{2}{3}, \frac{2}{3}, 4$

f. Domain = $[-5,0) \cup (0,5]$

g. Range = $[-4,4]$

$y = -3x + 2$
$0 = -3x + 2$
$-2 = -3x$
$\frac{2}{3} = x$

$y = -3x - 2$
$0 = -3x - 2$
$2 = -3x$
$\frac{2}{-3} = x$




h. $\lim_{x \to 4^-} g(x) =$ 0

i. $\lim_{x \to 0^+} g(x) =$ 2

j. $\lim_{x \to -4} g(x) =$ DNE