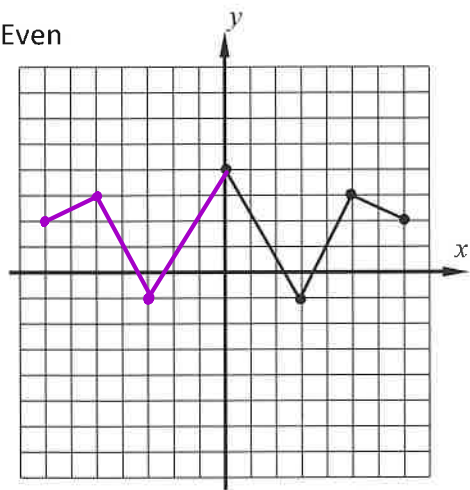


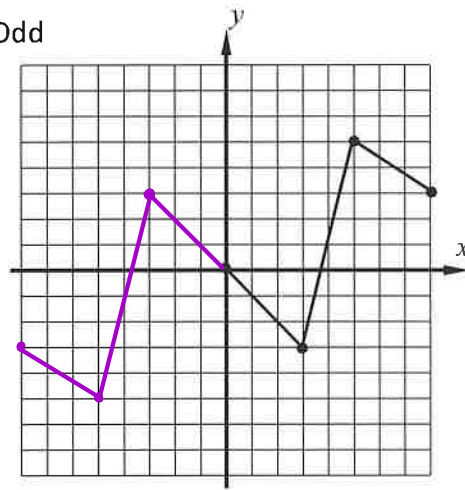
Homework 2-6 Even and Odd Functions Graphically

1. Half of the graph of $f(x)$ is shown below. Sketch the other half based on the function type.

(a) Even

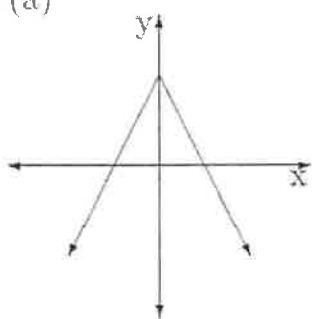


(b) Odd



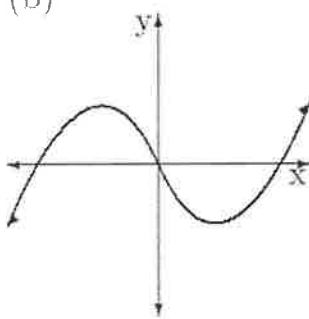
2. State whether the following functions are even, odd or neither:

(a)



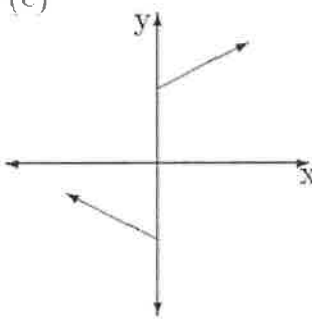
Even

(b)



Odd

(c)



Neither

3. Given the following equations, determine the end behavior of each:

a) $f(x) = 4x^3 + 2x^2 + 1$

$$\begin{aligned} x \rightarrow \infty, \quad f(x) &\rightarrow \underline{\infty} \\ x \rightarrow -\infty, \quad f(x) &\rightarrow \underline{-\infty} \end{aligned}$$

↓ ↑

b) $f(x) = -2x + 5x^4 - 9$

$f(x) = 5x^4 - 2x - 9$

$$\begin{aligned} x \rightarrow \infty, \quad f(x) &\rightarrow \underline{\infty} \\ x \rightarrow -\infty, \quad f(x) &\rightarrow \underline{\infty} \end{aligned}$$

↑ ↑

4. Given $f(x) = 4x^3 + 6x^2 - 13$ and $g(x) = 2x + 1$, state the quotient and remainder of $\frac{f(x)}{g(x)}$,
in the form $q(x) + \frac{r(x)}{g(x)}$.

$$\begin{array}{r}
 2x^2 + 2x - 1 \\
 2x+1 \overline{) 4x^3 + 6x^2 + 0x - 13} \\
 \underline{-(4x^3 + 2x^2)} \quad \downarrow \\
 4x^2 + 0x \quad \downarrow \\
 \underline{-(4x^2 + 2x)} \quad \downarrow \\
 -2x - 13 \quad \downarrow \\
 \underline{-(-2x + 1)} \\
 -12
 \end{array}$$

$$\boxed{2x^2 + 2x - 1 + \frac{-12}{2x+1}}$$

$$\begin{array}{r}
 -\frac{1}{2} \overline{) 4 \quad 6 \quad 0 \quad -13} \\
 \underline{\downarrow -2 \quad -2 \quad +1} \\
 4 \quad 4 \quad -2 \quad -12
 \end{array}$$

↑
can't use
synthetic!

5. Given $r(x) = x^4 - 5x^3 - 13x^2 + 77x - 60$, find the value of $r(5)$. What does your answer tell you about $x - 5$ as a factor of $r(x)$? Explain.

$r(5) = 0$ ← remainder

plug in
5 for x

$x - 5$ is a factor of $r(x)$ because the
remainder is zero!

6. Solve for x: $\frac{12}{x^2 - 16} - \frac{24}{x - 4} = 3$

$(x+4)(x-4)$

LCD: $(x+4)(x-4)$

$$\frac{(x+4)(x-4) \cdot 12}{(x+4)(x-4)} - \frac{(x+4)(x-4) \cdot 24}{x-4} = \frac{(x+4)(x-4) \cdot 3}{1}$$

$$12 - 24(x+4) = 3(x+4)(x-4)$$

$$12 - 24x - 96 = 3(x^2 - 16)$$

$$-24x - 84 = 3x^2 - 48$$

$$+24x + 84 \quad +24x + 84$$

$$0 = \frac{3x^2}{3} + \frac{24x}{3} + \frac{36}{3}$$

$$0 = x^2 + 8x + 12$$

$$0 = (x+2)(x+6)$$

$$x = -2 \quad | \quad x = -6$$

☐ I got

☐ I almost got it...

☐ I need more practice...

☐ I don't get it... Help!