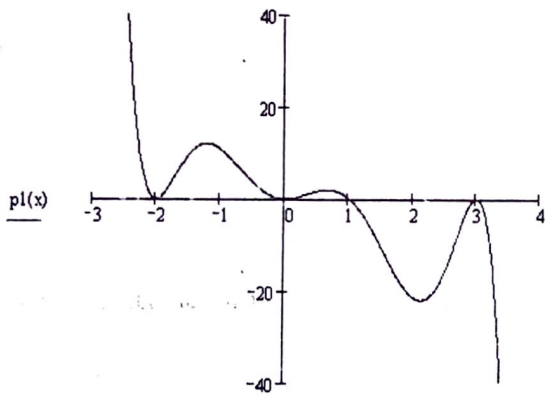


Fill in the table below.

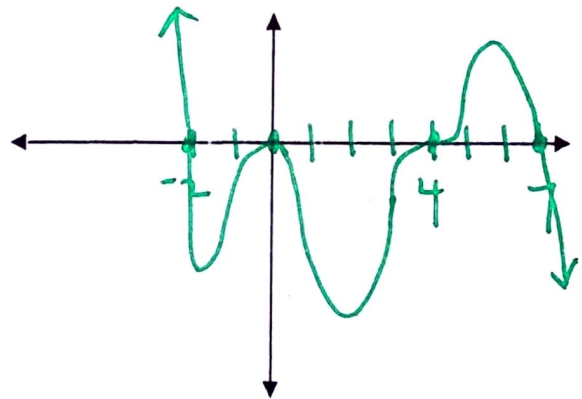
Function	Is the degree even or odd?	Is the leading coefficient positive or negative?	As $x \rightarrow -\infty, y \rightarrow$	As $x \rightarrow \infty, y \rightarrow$
1. $y = -x(x+3)^2(2x-5)^6(x+1)^1$	even (10)	-	$-\infty$	$-\infty$
2. $y = 22x^3 - 3x^5 + 4x - 23 + 10x^2$	odd (5)	-	∞	$-\infty$
3. $y = -11x^8$	even (8)	-	$-\infty$	$-\infty$
$y = x(x+2)^2(x-4)^3(x-1)^2$	even (8)	+	∞	∞

4. Use the given graph to write the equation of the function.



4. $y = -(x+2)^2(x^2)(x-1)(x-3)^2$

5. Sketch the graph for $f(x) = -x^2(x+2)(x-4)^3(x-7)$



6. Divide $(x^4 - 3x^2 + 1) \div (x - 1)$

$$\begin{array}{r|rrrr} 1 & 1 & 0 & -3 & 1 \\ & & 1 & 1 & -2 \\ \hline & 1 & 1 & -2 & -1 \end{array}$$

$$\boxed{x^3 + x^2 - 2x + \frac{-1}{x-1}}$$

7. Find $f(-3)$ for the function $f(x) = x^3 + 3x^2 + 2x + 8$. Is -3 a factor of $f(x)$?

$$\begin{array}{r|rrrr} -3 & 1 & 3 & 2 & 8 \\ & & -3 & 0 & -6 \\ \hline & 1 & 0 & 2 & 2 \end{array}$$

since remainder = 2 \neq 0,
-3 is not a root of $f(x)$.

8. Find all roots of $y = x^3 + 3x^2 - 10x - 24$ given that $(x + 2)$ is a factor. (Hint: Use synthetic division)

$$\begin{array}{r|rrrr} -2 & 1 & 3 & -10 & -24 \\ & & -2 & -2 & 24 \\ \hline & 1 & 1 & -12 & 0 \end{array}$$

$$\begin{aligned} x^2 + x - 12 &= 0 \\ (x-3)(x+4) &= 0 \\ \boxed{x = 3, -4, -2} &\text{ (roots)} \end{aligned}$$