1. Describe the end behavior of the function using infinity notation.
2. Find the difference:
$\left(5 x^{3}+2 x^{2}+4 x-8\right)-\left(5 x^{3}-3 x^{2}+9 x-10\right)$
$h(x)=-6 x^{3}+6 x^{2}+2 x+10$
3. Find the product: a) $(x-3)\left(2 x^{2}-4 x+6\right)$
b) $(3 x-7)(3 x+7)$
c) $(5 x+2)^{2}$
d) $(x+2)^{3}$
4. Use you answer Pascal's triangle to expand ( $3 x+2)^{4}$
5. Divide using long division.
6. Use synthetic division to divide
$\left(2 x^{2}+x-17\right) \div(x-4)$
$\left(-2 x^{3}+4 x^{2}+8 x+10\right) \div(x+3)$

7 Use synthetic division to evaluate the function
8 Factor completely : $x^{3}-7 x^{2}-18 x$

$$
\text { for } x=-1 \quad g(x)=3 x^{3}-2 x^{2}+2 x-5
$$

9. Factor completely $x^{3}-2 x^{2}-9 x+18$
10. Factor completely $2 x^{2}-8$
11. Factor completely $9 x^{3}+21 x^{2}+6 x$
12. Solve the equations:
a. $3 x^{3}-15 x=0$
b. $x^{3}-3 x^{2}-10 x=0$
13. Find all the roots of $h(x)=x^{3}+x^{2}-17 x+15$
14. Write a polynomial function (in function form) of least degree with leading coefficient of 1 and zeros:
a) $3,-1$, and -2
b) 3 and $2 i$
15. Sketch a graph of a polynomial function $f$ that has the given characteristics.

The graph has these three x -intercepts at $\mathrm{x}=-1, \mathrm{x}=1$, and $\mathrm{x}=3$

- $\quad f$ has a local maximum at $f(2)$
- $f$ has a local minimum at $f(0)$

20. Graph the function $f(x)=(x+1)(x-1)(x-2)$
(include specific points between and beyond the $x$-intercepts)
