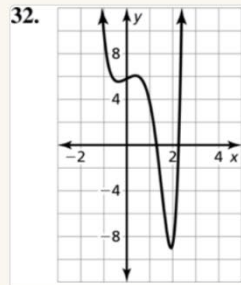
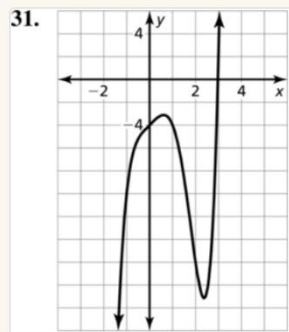
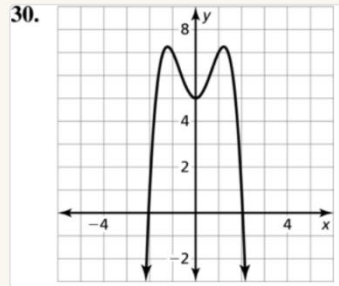
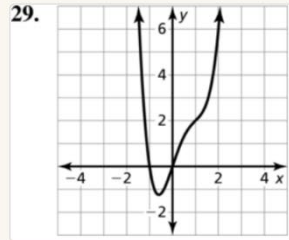
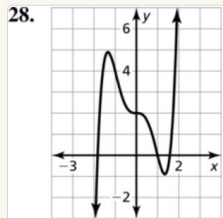
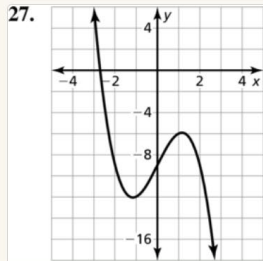
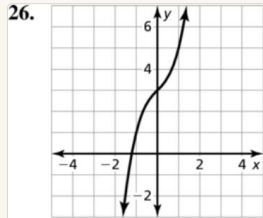
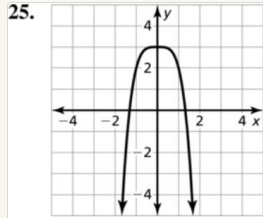


23. polynomial function; $f(x) = -4x^4 + \frac{5}{2}x^3 + \sqrt{2}x^2 + 4x - 6$; degree: 4 (quartic), leading coefficient: -4 .

24. The function f has degree 0 (constant) because it can also be written as $f(x) = 13x^0$. The leading coefficient is 13; $f(x) \rightarrow 13$ as $x \rightarrow -\infty$ and $f(x) \rightarrow 13$ as $x \rightarrow \infty$ because the y -values are always 13.



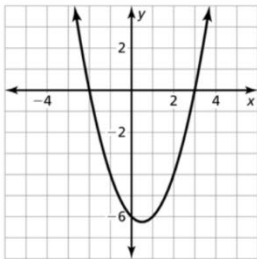
33. a. The function is increasing when $x > 4$ and decreasing when $x < 4$.
 b. $x < 3$ and $x > 5$
 c. $3 < x < 5$

34. a. The function is increasing when $x < -4$ and decreasing when $x > -4$.
 b. $-6 < x < -2$
 c. $x < -6$ and $x > -2$

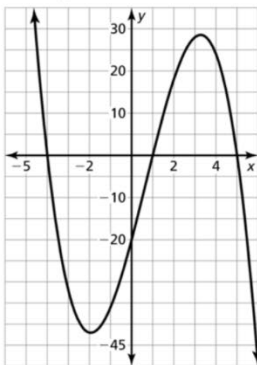
35. a. The function is increasing when $x < 0$ and $x > 2$ and decreasing when $0 < x < 2$.
 b. $-1 < x < 2$ and $x > 2$
 c. $x < -1$

36. a. The function is increasing when $x < -1$ and $x > 1$ and decreasing when $-1 < x < 1$.
 b. $x > 2$
 c. $x < -1$ and $-1 < x < 2$

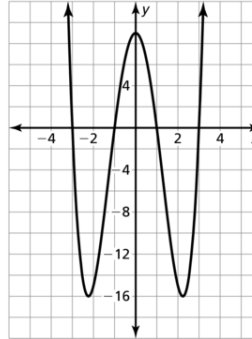
37. The degree is even and the leading coefficient is positive.



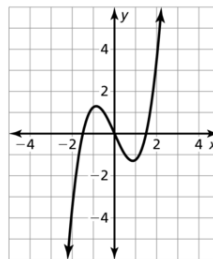
38. The degree is odd and the leading coefficient is negative.



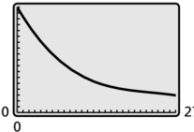
39. The degree is even and the leading coefficient is positive.



40. The degree is odd and the leading coefficient is positive.



41. a. 2422



From 1980 to 2007 the number of open drive-in theaters decreased. Around the year 1995, the rate of decrease began to level off.

- b. 1980 to 1995: about -119.6 , 1995 to 2007: about -19.2 ; About 120 drive-in movie theaters closed each year on average from 1980 to 1995. From 1995 to 2007, drive-in movie theaters were closing at a much lower rate, with about 20 theaters closing each year.
- c. Because the graph declines so sharply in the years leading up to 1980, it is most likely not accurate. The model may be valid for a few years before 1980, but in the long run, decline may not be reasonable. After 2007, the number of drive-in movie theaters declines sharply and soon becomes negative. Because negative values do not make sense given the context, the model cannot be used for years after 2007.

42. $w \approx 8.53$ carats

43. Because the graph of g is a reflection of the graph of f in the y -axis, the end behavior would be opposite; $g(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $g(x) \rightarrow \infty$ as $x \rightarrow \infty$.