

ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit

4

Practice Tes

1-17

ALL EVEN

Show Solu

ODD

1. The function is not a polynomial function. Polynomial functions do not have exponential terms.

2. The function is a polynomial function.

$$g(x) = 3x^4 - 2x^3 - \frac{1}{2}x$$

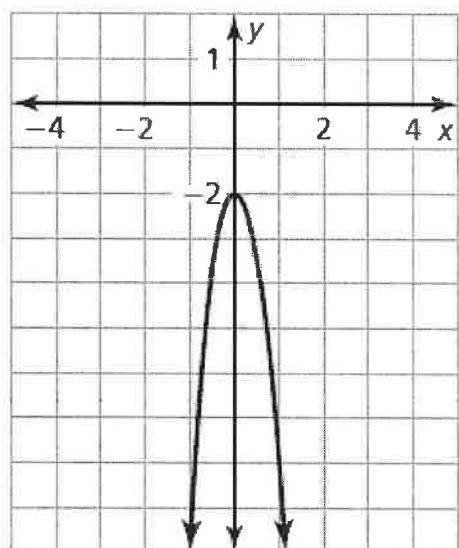
The degree is 4. It is a quartile function. The leading coefficient is 3.

$$3. y = -x^4 + x^3 - 6x^2 - 2$$

To graph the function, make a table of values and plot the corresponding points. Connect the points with a smooth curve and check the end behavior.

x	-2	-1	0	1	2
y	-50	-10	-2	-8	-34

The degree is even and the leading coefficient is negative. So, $g(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ and $g(x) \rightarrow -\infty$ as $x \rightarrow \infty$.



The graph does not have any x -intercepts. A local maximum occurs at $x = 0$, and there are no local minimums. The function appears to be increasing when $x < 0$, and decreasing when $x > 0$.

$$\begin{aligned}
 4. f(x) &= (x - 3)[x - (1 - \sqrt{2})][x - (1 + \sqrt{2})] \\
 &= (x - 3)[(x - 1) + \sqrt{2}][(x - 1) - \sqrt{2}] \\
 &= (x - 3)[(x - 1)^2 - 2] \\
 &= (x - 3)(x^2 - 2x + 1 - 2) \\
 &= (x - 3)(x^2 - 2x - 1) \\
 &= x^3 - 2x^2 - x - 3x^2 + 6x + 3 \\
 &= x^3 - 5x^2 + 5x + 3
 \end{aligned}$$

$$\begin{aligned}
 5. f(x) &= (x + 2)(x - 4)(x - 3i)(x + 3i) \\
 &= (x^2 - 4x + 2x - 8)[x^2 - (3i)^2] \\
 &= (x^2 - 2x - 8)(x^2 + 9) \\
 &= x^4 - 2x^3 - 8x^2 + 9x^2 - 18x - 72 \\
 &= x^4 - 2x^3 + x^2 - 18x - 72
 \end{aligned}$$

$$\begin{aligned}
 6. (x^6 - 4)(x^2 - 7x + 5) &= x^8 - 7x^7 + 5x^6 - 4x^2 + 28x - 20 \\
 &= x^8 - 7x^7 + 5x^6 - 4x^2 + 28x - 20
 \end{aligned}$$

$$\begin{aligned}
 7. (2x + 3)^3 &= (2x)^3 + 3(2x)^2(3) + 3(2x)(3)^2 + (3)^3 \\
 &= 8x^3 + 36x^2 + 54x + 27
 \end{aligned}$$

$$8. \begin{array}{r|rrrr}
 -2 & 2 & -3 & 5 & -1 \\
 & -4 & 14 & -38 & \\
 \hline
 & 2 & -7 & 19 & -39
 \end{array}$$

$$\frac{2x^3 - 3x^2 + 5x - 1}{x + 2} = 2x^2 - 7x + 19 - \frac{39}{x + 2}$$

$$\begin{array}{r}
 9. \qquad \qquad \qquad 3x^2 + 4x + 5 \\
 x^2 - 2x + 1 \overline{) 3x^4 - 2x^3 + 0x^2 - x - 1} \\
 \underline{3x^4 - 6x^3 + 3x^2} \\
 4x^3 - 3x^2 - x \\
 \underline{4x^3 - 8x^2 + 4x} \\
 5x^2 - 5x - 1 \\
 \underline{5x^2 - 10x + 5} \\
 5x - 6
 \end{array}$$

$$\frac{3x^4 - 2x^3 - x - 1}{x^2 - 2x + 1} = 3x^2 + 4x + 5 + \frac{5x - 6}{x^2 - 2x + 1}$$

$$10. 27x^3 + 64 = (3x)^3 + 4^3 = (3x + 4)(9x^2 - 12x + 16)$$

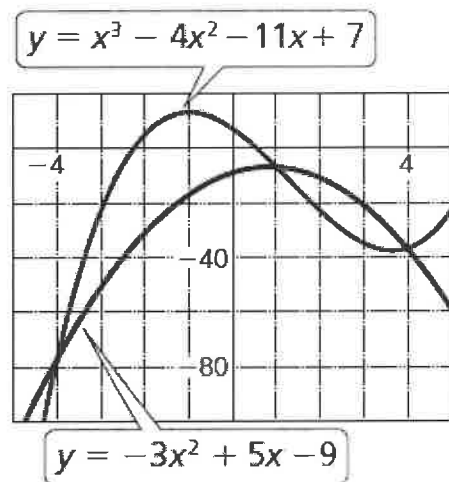
$$\begin{aligned}
 11. 8x^2 - 125x^5 &= x^2(8 - 125x^3) \\
 &= x^2[2^3 - (5x)^3] \\
 &= x^2(2 - 5x)(4 - 10x + 25x^2)
 \end{aligned}$$

$$\begin{aligned}
 12. 16x^4 - 1 &= (4x^2)^2 - 1^2 \\
 &= (4x^2 - 1)(4x^2 + 1) \\
 &= (2x - 1)(2x + 1)(4x^2 + 1)
 \end{aligned}$$

$$\begin{aligned}
 13. 2x^9 - 4x^5 - 16x &= 2x(x^8 - 2x^4 - 8) \\
 &= 2x(x^4 - 4)(x^4 + 2) \\
 &= 2x(x^2 - 2)(x^2 + 2)(x^4 + 2)
 \end{aligned}$$

14. a. f has one zero (repeated 4 times) because the graph of f has only one x -intercept.
 g has one zero (repeated 4 times) because the graph of g has only one x -intercept.
- b. The graph of g is the graph of f translated 3 units to the right.
- c. g is increasing when $x > 3$ and decreasing when $x < 3$.

15. Use technology to graph the equations.



The graphs intersect at $(-4, -77)$, $(1, -7)$, and $(4, -37)$.

Sample answer: Since substitution will be complicated and the equations are not of the same form, use graphing to solve the system.

$$16. T = P + C = 20t^4 - 374t^3 + 2277t^2 - 3918t + 8449$$

$$T(3) = 20(3)^4 - 374(3)^3 + 2277(3)^2 - 3918(3) + 8449$$

$$= 8710$$

In the third year, the total number of passenger cars and commercial vehicles produced was 8,710,000.

17.

$p(1)$	$p(2)$	$p(3)$	$p(4)$	$p(5)$	$p(6)$	
65	86	129	200	305	450	
	21	43	71	105	145	First differences
		22	28	34	40	Second differences
			6	6	6	Third differences

The third differences are constant, so the degree of the polynomial is 3.

A polynomial function is $p = x^3 + 5x^2 - x + 60$.

$$p(7) = 641$$

The predicted profit in the seventh month is \$641.