

Section 3.4 Extra Practice

1. Solve.

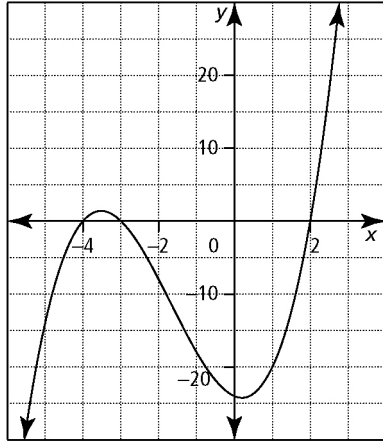
a) $(x + 5)(x + 2)(x - 3)(x - 6) = 0$

b) $x^3 - 27 = 0$

c) $(3x + 1)(x - 4)(x - 7) = 0$

d) $x(x + 4)^3(x + 2)^2 = 0$

2. For this graph, identify the following:

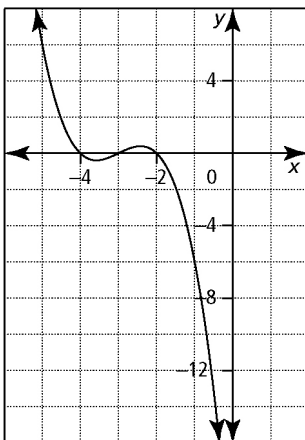


a) the zeros

b) the intervals where the function is positive

c) the intervals where the function is negative

3. For the graph of this polynomial function, determine the following:



a) the least possible degree

b) the sign of the leading coefficient

c) the x -intercepts and the factors of the function

d) the intervals where the function is positive and the intervals where it is negative

4. The graph of $y = x^3$ is transformed to obtain the graph of $y = -2(4(x + 1))^3 - 5$. Copy and complete the table.

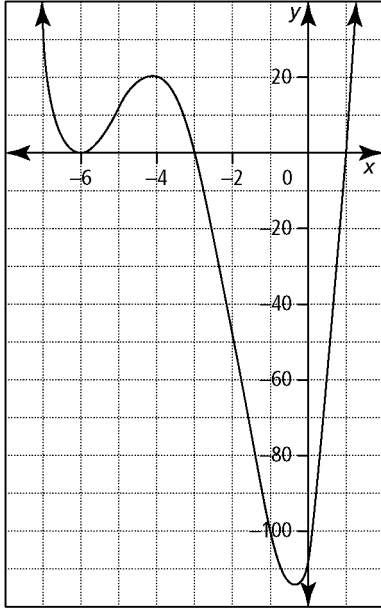
$y = x^3$	$y = (4x)^3$	$y = -2(4x)^3$	$y = -2(4(x + 1))^3 - 5$
(-2, -8)			
(-1, -1)			
(0, 0)			
(1, 1)			
(2, 8)			

5. The graph of $y = x^4$ is transformed to obtain the graph of $y = \frac{1}{4}\left(\frac{1}{2}(x - 9)\right)^4 + 3$. Copy and complete the table.

$y = x^4$	$y = \left(\frac{1}{2}x\right)^4$	$y = \frac{1}{4}\left(\frac{1}{2}x\right)^4$	$y = \frac{1}{4}\left(\frac{1}{2}(x - 9)\right)^4 + 3$
(-2, -16)			
(-1, 1)			
(0, 0)			
(1, 1)			
(2, 16)			



6. For the graph of this polynomial function, determine the following:



- the least possible degree
 - the sign of the leading coefficient
 - the x -intercepts and the factors of the function
 - the intervals where the function is positive and the intervals where it is negative
7. Without using a graphing calculator, determine the following for $y = x^3 + 4x^2 - x - 4$:
- the zeros of the function
 - the degree and end behaviour of the function
 - the y -intercept
 - the intervals where the function is positive and the intervals where it is negative

8. Sketch a graph of each function without using technology. Label all intercepts.

a) $y = x^3 - 4x^2 - 5x$

b) $f(x) = -x^4 + 19x^2 + 6x - 72$

c) $g(x) = x^5 - 14x^4 + 69x^3 - 140x^2 + 100x$

9. Determine the equation with least degree for each polynomial function.

a) a cubic function with zeros 3 (multiplicity 2) and -1 , and y -intercept = 18

b) a quintic function with zeros -2 (multiplicity 3) and 4 (multiplicity 2), and y -intercept = -32

c) a quartic function with zeros -1 (multiplicity 2) and 5 (multiplicity 2), and y -intercept = -10

10. Determine three consecutive integers with a product of -504 .

11. A toothpaste box has square ends. The length of the box is 12 cm greater than the width. The volume is 135 cm^3 . What are the dimensions of the box?

12. The dimensions of a rectangular prism are 10 cm by 10 cm by 5 cm. When each dimension is increased by the same length, the new volume is 1008 cm^3 . What are the dimensions of the new prism?

