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BLM 3–5

Section 3.3 Extra Practice

1. What is the corresponding binomial factor of a polynomial $P(x)$ given the value of the zero?

a) $P(6) = 0$

b) $P(-7) = 0$

c) $P(2) = 0$

d) $P(-5) = 0$

2. Determine whether $x - 1$ is a factor of each polynomial.

a) $-4x^4 - 3x^3 + 2x^2 - x + 5$

b) $7x^5 + 5x^4 + 23x^2 + 8$

c) $2x^4 - 3x^3 - 5x^2 + 6x - 1$

d) $2x^3 + 5x^2 - 7$

3. State whether each polynomial has $x + 2$ as a factor.

a) $-3x^3 + 2x^2 + 10x + 5$

b) $5x^2 + 6x - 8$

c) $2x^4 - 3x^3 - 5x^2$

d) $3x^3 - 12x - 2$

4. What are the possible integral zeros of each polynomial?

a) $P(n) = n^3 - 2n^2 - 5n + 12$

b) $P(p) = p^4 - 3p^3 - p^2 + 7p - 6$

c) $P(z) = z^4 + 4z^3 + 3z^2 + 8z - 25$

d) $P(y) = y^4 - 11y^3 - 2y^2 + 2y + 10$

5. The factors of a polynomial are $x + 3$, $x - 4$, and $x + 1$. Describe how the zeros of the polynomial expression could be used to determine the zeros of the corresponding function.

6. Factor completely.

a) $x^3 + 2x^2 - 13x + 10$

b) $x^4 - 7x^3 + 3x^2 + 63x - 108$

c) $x^3 - x^2 - 26x - 24$

d) $x^4 - 26x^2 + 25$

7. Factor completely.

a) $x^3 + x^2 - 16x - 16$

b) $x^3 - 2x^2 - 6x - 8$

c) $k^3 + 6k^2 - 7k - 60$

d) $x^3 - 27x + 10$

8. Factor completely.

a) $x^4 + 4x^3 - 7x^2 - 34x - 24$

b) $x^5 + 3x^4 - 5x^3 - 15x^2 + 4x + 12$

9. Determine the value(s) of k so that the binomial is a factor of the polynomial.

a) $x^2 - 8x - 20$, $x + k$

b) $x^2 - 3x - k$, $x - 7$

10. Each polynomial has a factor of $x - 3$. What is the value of k in each case?

a) $kx^3 - 10x^2 + 2x + 3$

b) $4x^4 - 3x^3 - 2x^2 + kx - 9$

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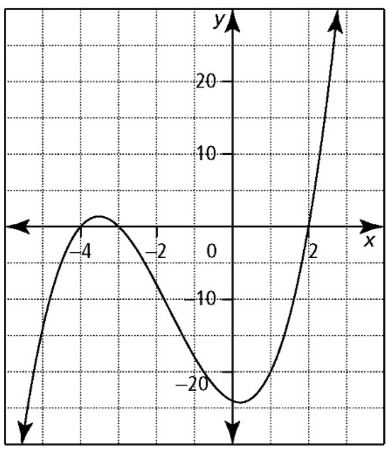
BLM 3–6

Section 3.4 Extra Practice

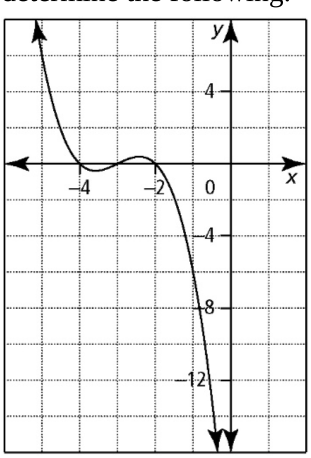
1. Solve.
a) $(x + 5)(x + 2)(x - 3)(x - 6) = 0$
b) $x^3 - 27 = 0$
c) $(3x + 1)(x - 4)(x - 7) = 0$
d) $x(x + 4)^3(x + 2)^2 = 0$

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)			

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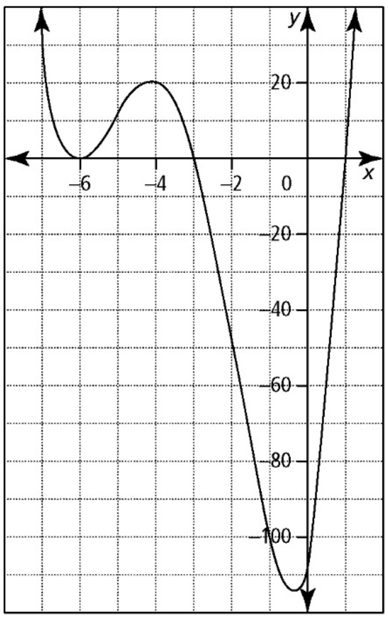
6. For the graph of this polynomial function, determine the following:



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

7. Without using a graphing calculator, determine the following for $y = x^3 + 4x^2 - x - 4$:

a) the zeros of the function
b) the degree and end behaviour of the function
c) the y-intercept
d) the intervals where the function is positive and the intervals where it is negative

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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?

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