

Chapter 3 BLM Answers

BLM 3-3 Section 3.1 Extra Practice

1. a) Not a polynomial; the exponent of the variable

is not a whole number: $\frac{1}{x} = x^{-1}$ b) degree = 2

c) degree = 6 d) Not a polynomial; the exponent of the variable is not a whole number: $\sqrt[3]{x} = x^{\frac{1}{3}}$

2. a) -1; 3 b) 9; 5 c) 3; 1 d) -2; 9

3. a) odd; neither b) even; minimum c) odd; neither d) even; maximum

4. a) 3; domain: $\{x | x \in \mathbb{R}\}$; range: $\{y | y \in \mathbb{R}\}$

b) 2; domain: $\{x | x \in \mathbb{R}\}$; range: $\{y | y \leq 9, y \in \mathbb{R}\}$

c) 4; domain: $\{x | x \in \mathbb{R}\}$; range: $\{y | y \geq -12.25, y \in \mathbb{R}\}$

d) 4; domain: $\{x | x \in \mathbb{R}\}$; range: $\{y | y \in \mathbb{R}\}$

5. a) 0, 1, 2, or 3; y-intercept = 3 b) 0, 1, 2, 3, or 4; y-intercept = 5 c) 0, 1, 2, 3, or 4; y-intercept = 1

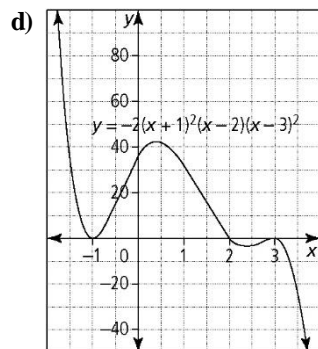
d) 0, 1, or 2; y-intercept = 0

6. a) degree of 4, even-degree polynomial; opens downward, extends down into quadrant III and down into quadrant IV; maximum of four x-intercepts; has a maximum value; y-intercept = 5

b) degree of 5, odd-degree polynomial; extends up into quadrant I and down into quadrant III; maximum of 5 x-intercepts; no maximum or minimum values; y-intercept = 12

7. a) extends up into quadrant II and down into quadrant IV

b) 3 c) 36



8. a) quartic b) quintic c) cubic d) quadratic

9. a) 2 b) -4.9; constant = 60; The constant represents the height the object fell from.

c) The domain, t , must be greater than or equal to zero, because it represents time.

d) opens downward; lies only within quadrant I; points begin on the y-axis and end on the x-axis; maximum value = 60

10. 3.5 s

BLM 3-4 Section 3.2 Extra Practice

1. a) $\frac{x^2 - x - 15}{x - 4} = (x + 3) - \frac{3}{x - 4}$ b) $x \neq 4$

c) $x^2 - x - 15 = (x - 4)(x + 3) - 3$

d) To check, multiply the divisor by the quotient and add the remainder.

2. a)

$$\frac{x^4 - 3x^3 + 2x^2 + 55x - 11}{x + 3} = (x^3 - 6x^2 + 20x - 5) + \frac{4}{x + 3}$$

b) $x \neq -3$ c) To check, multiply the divisor by the quotient and add the remainder.

3. a) $3x + 1$ b) $2x^2 - 20x + 85$ c) $2w^3 - 3w^2 + 4w - 10$

4. a) 233 b) -7 c) 36

5. a) $4w^3 - 5w^2 + 3w - 4$ b) $x^3 + 4x^2 - 5$

c) $5y^3 - 5y^2 + 7y - 8$

6. a) 0 b) 179 c) -19

7. a) -25 b) -44 c) -65

8. a) -22 b) 0 c) 831

9. 2

10. 4 and -2

BLM 3-5 Section 3.3 Extra Practice

1. a) $x - 6$ b) $x + 7$ c) $x - 2$ d) $x + 5$

2. a) No b) No c) No d) Yes

3. a) No b) Yes c) No d) No

4. a) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$ b) $\pm 1, \pm 2, \pm 3, \pm 6$

c) $\pm 1, \pm 5, \pm 25$ d) $\pm 1, \pm 2, \pm 5, \pm 10$

5. Example: Since the factors are $x + 3$, $x - 4$, and $x + 1$, the corresponding zeros of the function are -3, 4, and -1. The zeros can be confirmed by graphing $P(x)$ and using the trace or zero feature of a graphing calculator.

6. a) $(x - 1)(x - 2)(x + 5)$ b) $(x - 3)^2(x + 3)(x - 4)$

c) $(x + 1)(x - 4)(x - 6)$ d) $(x - 1)(x + 1)(x - 5)(x + 5)$

7. a) $(x + 1)(x - 4)(x + 4)$ b) $(x - 4)(x^2 + 2x + 2)$

c) $(k - 3)(k + 4)(k + 5)$ d) $(x - 5)(x^2 + 5x - 2)$

8. a) $(x + 4)(x + 2)(x + 1)(x - 3)$

b) $(x + 3)(x + 2)(x + 1)(x - 1)(x - 2)$

9. a) 2, -10 b) 28

10. a) 3 b) -72

BLM 3-6 Section 3.4 Extra Practice

1. a) -5, -2, 3, 6 b) ± 3 c) $-\frac{1}{3}, 4, 7$ d) 0, -2, -4

2. a) -3, 2, -4 b) $(-4, -3), (2, \infty)$

c) $(-\infty, -4), (-3, 2)$



3. a) 3 b) negative c) $-4, -2, -3$;
 $(x + 4), (x + 2), (x + 3)$ d) positive intervals:
 $x < -4$ and $-3 < x < -2$ negative interval: $-4 < x < -3$
and $x > -2$

4.

$y = x^3$	$y = (4x)^3$	$y = -2(4x)^3$	$y = -2(4(x + 1))^3 - 5$
$(-2, -8)$	$(-0.5, -8)$	$(-0.5, 16)$	$(-1.5, 11)$
$(-1, -1)$	$(-0.25, -1)$	$(-0.25, 2)$	$(-1.25, -3)$
$(0, 0)$	$(0, 0)$	$(0, 0)$	$(-1, -5)$
$(1, 1)$	$(0.25, 1)$	$(0.25, -2)$	$(-0.75, -7)$
$(2, 8)$	$(0.5, 8)$	$(0.5, -16)$	$(-0.5, -21)$

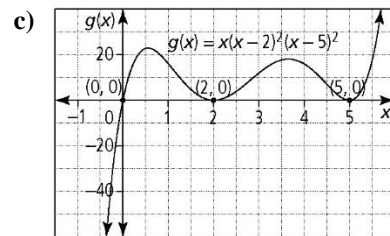
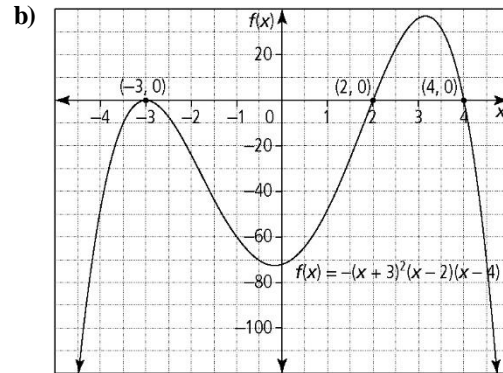
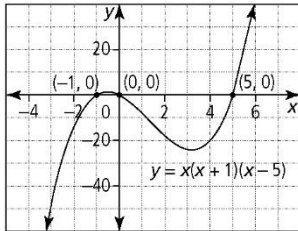
5.

$y = x^4$	$y = \left(\frac{1}{2}x\right)^4$	$y = \frac{1}{4}\left(\frac{1}{2}x\right)^4$	$y = \frac{1}{4}\left(\frac{1}{2}(x-9)\right)^4 + 3$
$(-2, -16)$	$(-4, -16)$	$(-4, -4)$	$(5, -1)$
$(-1, 1)$	$(-2, 1)$	$(-2, 0.25)$	$(7, 3.25)$
$(0, 0)$	$(0, 0)$	$(0, 0)$	$(9, 3)$
$(1, 1)$	$(2, 1)$	$(2, 0.25)$	$(11, 3.25)$
$(2, 16)$	$(4, 16)$	$(4, 4)$	$(13, 7)$

6. a) 4 b) positive c) $-6, -3, 1$; $(x + 6), (x + 3), (x - 1)$ d) positive intervals: $(-\infty, -6), (-6, -3), (1, \infty)$; negative interval: $(-3, 1)$

7. a) $-4, -1, 1$ b) 3; starts in quadrant III and extends to quadrant I c) -4 d) positive intervals: $(-4, -1), (1, \infty)$; negative intervals: $(-\infty, -4), (-1, 1)$

8. a)



9. a) $y = 2(x - 3)^2(x + 1)$ b) $y = -\frac{1}{4}(x + 2)^3(x - 4)^2$

c) $f(x) = -\frac{2}{5}(x + 1)^2(x - 5)^2$

10. $-9, -8, -7$

11. 3 cm by 3 cm by 15 cm

12. 12 cm by 12 cm by 7 cm

