Math 1021– Beginning of the Semester Review Answer Key

1. 81

2. - 81

3. - 8

4 - 4

5. The root does not exist as a real number.

6. subtract the smaller absolute value from the larger and precede the result by the sign of the term with the larger absolute value.

7. changing the sign

8. $a + (-b)$

9. $a \cdot \dfrac{1}{b}$

10. -9 **11.** -8 **12.** 13   **13.** -5 **14.** 15   **15.** -4

16. $x + 7$ **17.** $-6 + y$ **18.** $-x - y$

19. $-4b$ **20.** $-5y$

21. Linear functions are b and d; others are not.

22. 2^8 **23.** 7^{10} **24.** $\left(-5\right)^6$

25. x^{12} **26.** 4^{24} **27.** $2^6 a^6 b^6$

28. $\dfrac{a^{15}}{bc^9}$ **29.** a. perpendicular   b. neither parallel nor perpendicular

30.   a. $D = \{0,1,2\}$, $R = \{-2,1,2,3\}$
         Not a function
     b. $D = \{-4, -2, 0, 2\}$, $R = \{0,1,2,3\}$
         Function
     c. $D = \{-1,4,5,7\}$, $R = \{2,3\}$
         Function
     d. $D = \{\text{Input elements}\}$,
        $R = \{\text{Output elements}\}$
         Function
     e. $D = (-\infty, \infty)$, $R = -3, \infty)$
         Function
     f. $D = (-\infty, \infty)$, $R = \{2\}$
         Function
     g. $D = [1, \infty)$, $R = (-\infty, \infty)$
         Not a function

31. a. $D_R = (-\infty, -3) \cup (-3, \infty)$
   b. $D_Q = (-\infty, -3) \cup (-3, 8) \cup (8, \infty)$

32. (a) $\dfrac{16}{15}$ (b) $\dfrac{5}{6}$ (c) $\dfrac{9x}{3x+1}$ (d) $\dfrac{10t+8}{t(t+2)}$ (e) $\dfrac{x-2}{x(x-4)}$
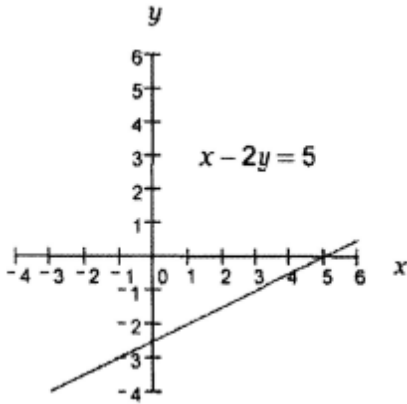
33. (a) 2 (b) $\dfrac{13}{24}$ (c) $\dfrac{-b}{3b+2}$ (d) $\dfrac{-2k+8}{k(k+2)}$ (e) $\dfrac{x-4}{4x}$

34. (a) $\dfrac{3}{2}$ (b) $\dfrac{45}{16}$ (c) $\dfrac{3mx^2 y^2}{2}$ OR $\dfrac{3}{2}mx^2 y^2$ (d) $2(x-3)$
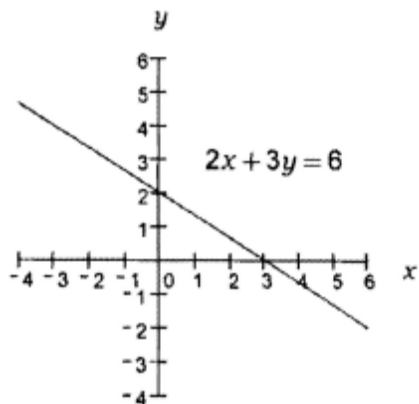
35. (a) $\dfrac{7}{4}$ (b) $\dfrac{1}{4}$ (c) $\dfrac{9x^3 y^3}{ab}$ (d) $\dfrac{x-3}{x+3}$
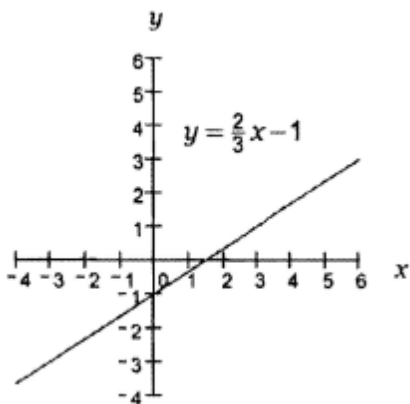
36. (a) $17a - 12b - 15$ (b) $3x + y + 2$

37. (a) x-intercept $= 5$
   y-intercept $= -\dfrac{5}{2}$

   (b) x-intercept $= 3$
       y-intercept $= 2$

$2x + 3y = 6$

(c) x-intercept $= \frac{3}{2}$

y-intercept $= -1$

$y = \frac{2}{3}x - 1$

38. (a) $x = -3$ (b) identity; Solution: All real numbers.   (c) $y = \frac{1}{3}$

(d) contradiction; No Solution.   (e) $x = 2$ (f) $x = \frac{1}{3}$

39. (a) $x_1 = 0$, $x_2 = 4$ (b) $z_1 = 0$, $z_2 = \frac{1}{3}$ (c) $y_1 = -2$, $y_2 = 6$

(d) $x_1 = -\frac{1}{2}$, $x_2 = \frac{5}{3}$ (e) $b_1 = -3$, $b_2 = 0$, $b_3 = 6$

(f) $a_1 = -4$, $a_2 = -\frac{4}{3}$ (g) $x_1 = -4$, $x_2 = -1$, $x_3 = 1$

40. $4 - \dfrac{x}{6}$

41. yes

42. (a) $x > 1, (1, \infty)$ (b) $x \le 5, (-\infty, 5]$ (c) $-\dfrac{9}{2} < x < 7, (-\dfrac{9}{2}, 7)$

   (d) $\dfrac{7}{8} < x \le \dfrac{27}{20}, \ (\dfrac{7}{8}, \dfrac{27}{20}]$

43. (a) $y = \dfrac{1}{4}x - 3$ (b) $3x + 7y = 35$ (c) $y = -\dfrac{1}{5}x - \dfrac{28}{5}$ (d) $3x - y = 7$

44. (a) $(x - 7)(x - 5)$ (b) $2y(y - 8)(y - 3)$ (c) $6(y - 3)$

   (d) $(x - 9)(x + 9)$ (e) $4x^2 y^2(y - 3x)$ (f) $(5a - 2)(2a - 3)$

   (g) $-4(x - 4)(x + 4)$ (h) $(6x - 5)(3x - 4)$

45. (a) $7x^2 - 10x - 7$ (b) $-3x^2 + 15x - 15$ (c) $-6x^7 - 15x^4 + 21x^3$

   (d) $12x^2 + x - 35$ (e) $49x^2 - 56x + 16$ (f) $-\dfrac{1}{28}x^{10}$

   (g) $-\dfrac{1}{28}x^{10}$ (h) $2x^3 - 11x^2 - 25x + 28$

46. (a) $3a^4 \sqrt{2a}$, values of a are nonnegative   (b) $4p^2 q^3 \sqrt[3]{pq}$ (c) $2x$

   (d) $\dfrac{x^{13}}{y^7} \sqrt{\dfrac{15x}{y}}$, values of $x \ge 0$ and $y > 0$ (e) $2a^2 b \sqrt[5]{b^3}$