MATH1050 Exercise 1 Supplement (Answers)

1. (a) $x = -\dfrac{46}{3}$.

   (b) $x = 4$.

   (c) $x = -\sqrt{3}$ or $x = \sqrt{3}$.

   (d) $x = -\dfrac{3}{2} + \dfrac{\sqrt{33}}{2}$ or $x = -\dfrac{3}{2} - \dfrac{\sqrt{33}}{2}$.

2. (a) $x = 8$.

   (b) No real solution.

   (c) $x = 9$.

   (d) $x = \dfrac{9}{4}$.

   (e) $x = 3$.

   (f) $x = 3$.

   (g) $x = 2$.

   (h) $x = 441$.

   (i) $x = -\sqrt{17}$ or $x = \sqrt{17}$

3. (a) $x = 2$.

   (b) $x = 0$ or $x = \log_5(4)$.

   (c) $x = 2$ or $x = -2 - 2\log_2(3)$.

   (d) $x = 1$.

   (e) $x = 3$ or $x = 7$.

   (f) $x = \dfrac{1}{2}$ or $x = 8$.

   (g) $x = 1$.

   (h) $x = 2$.

   (i) $x = 343$.

   (j) $x = e^2$ or $x = 1$.

   (k) $x = \sqrt{e}$ or $x = e^{-3}$.

4. (a) $x = 12$ or $x = -\dfrac{26}{3}$.

   (b) $x = -4/3$ or $x = 16/3$.

   (c) $x = -1$ or $x = 1/5$.

   (d) $x = -1$ or $x = 6$ or $x = 2$ or $x = 3$.

   (e) $x = -5$ or $x = 4$ or $x = -3$ or $x = 2$.

   (f) $x = 0$ or $x = 1$ or $x = 4$ or $x = 5$.

   (g) $x = \dfrac{2}{3}$.

   (h) $x = 1$ or $x = 2$ or $x = 4$.

   (i) $x = 0$ or $x = 2$ or $x = 3$.

   (j) $x \geq 1$.

   (k) $x = -5$ or $x = -1$ or $x = 2$ or $x = 6$.

   (l) $x = -3$ or $x = -1$ or $x = 2$.

   (m) $x = -1$ or $x = 7$.

   (n) $x = 1$ or $x = 9$.

   (o) $x \leq 0$ or $x \geq 1$.

5. (a) Every real value of x is a solution of the equation.

   (b) Every real value of x is a solution of the equation.

   (c) No solution.

   (d) No solution.

   (e) $x = -1$.

   (f) Every real value of x other than 0 is a solution of the equation.

   (g) Every real value of x other than 1 is a solution of the equation.

   (h) Every real value of x other than $1, -1$ is a solution of the equation.

6. (a) $(x, y) = \left(\dfrac{3}{7}, \dfrac{13}{7}\right)$ or $(x, y) = (1, 1)$.

   (b) $(x, y) = (4, 5)$ or $(x, y) = (-7, 16)$.

   (c) $(x, y) = (0, 0)$ or $(x, y) = (-2, 2)$ or $(x, y) = \left(-\dfrac{6}{7}, \dfrac{4}{7}\right)$.

   (d) $(x, y) = (0, 0)$ or $(x, y) = (2, 1)$ or $(x, y) = \left(-\dfrac{2}{5}, \dfrac{1}{5}\right)$.

   (e) $(x, y) = \left(\dfrac{1}{5}, \dfrac{1}{3}\right)$ or $(x, y) = \left(-\dfrac{1}{5}, -\dfrac{1}{3}\right)$ or $(x, y) = \left(\dfrac{1}{3}, \dfrac{1}{5}\right)$ or $(x, y) = \left(-\dfrac{1}{3}, -\dfrac{1}{5}\right)$.

   (f) $(x, y) = (1, 2)$ or $(x, y) = (-1, 2)$ or $(x, y) = (-1, -2)$ or $(x, y) = (1, -2)$ or $(x, y) = (2, 1)$ or $(x, y) = (-2, 1)$ or $(x, y) = (-2, -1)$ or $(x, y) = (2, -1)$.

   (g) $(x, y) = (1, 4)$ or $(x, y) = (-1, -4)$ or $(x, y) = (4, 1)$ or $(x, y) = (-4, -1)$.

   (h) $(x, y) = (5, 2)$.

7. (a) $x = \dfrac{c + 1}{c}$.

   (b) $(\star_0)$ has no solution.

8. (a) $x = c + 1$.

   (b) Every real value of x is a real solution of $(\star_0)$.

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

   (b) i. $(a, b) = (1, 2)$ or $(a, b) = (3, 2)$.

      ii. When $(a, b) = (1, 2)$ or $(a, b) = (3, 2)$, every real value of x is a solution of $(\star_{a,b})$.

10. (a) $c = 4$.

    (b) $(x, y) = (-1, 2)$.

11. ——

12. ——

13. ——

14. ——

15. ——

16. ——

17. ——

18. ——

19. ——

20. ——

21. $P = 16$, $Q = 4$.

22. $A = 2$, $B = 3$, $C = 2$.