

1. Find all the values of  $u$  such that

$$\frac{u^3 - 15u^2 + 71u - 105}{u^2 - 7u + 10} = 0.$$

- ☐  $u = 3, 7$
- ☐  $u = 5, 7$
- ☐  $u = 2, 3, 5, 7$
- ☐  $u = 4, 5, 7$

2. What are all the values of  $x$  such that

$$\frac{x^3 - 9x^2 + 24x - 16}{x^2 - 4x + 4} = 0?$$

- ☐  $x = 1, 4$
- ☐  $x = 1, 4, 5$
- ☐  $x = 1, 2, 4$  (repeated)
- ☐  $x = 2$  (repeated)

3. Compute all the solutions to the

equation  $\frac{m^3 - 2m^2 + m}{m^2 - 8m + 15} = 0.$

- ☐  $m = 0, 1, 2$
- ☐  $m = 3, 5$
- ☐  $m = 0, 1$
- ☐  $m = 0, 1$

4. Find all the values of  $x$  such that

$$\frac{x^3 - 3x^2 + 2x}{x^2 - 7x + 12} = 0.$$

- ☐  $x = 0, 1, 2$
- ☐  $x = 0, 1, 2, 3$
- ☐  $x = 1$  (repeated), 2
- ☐  $x = 1, 2$

5. Compute all the solutions to the

equation  $\frac{w^3 - 9w^2 + 20w - 12}{w^2 - 4w + 4} = 0.$

- ☐  $w = 1, 6$
- ☐  $w = 2$  (repeated)
- ☐  $w = 2$  (repeated), 6
- ☐  $w = 2, 6$

6. Compute all the solutions to the

equation  $\frac{x^3 - 11x^2 + 36x - 36}{x^2 - 3x + 2} = 0.$

- ☐  $x = 2, 4, 6$
- ☐  $x = 3, 6$
- ☐  $x = 2, 6$
- ☐  $x = 2$  (repeated), 3, 6

7. Find all the solutions to the equation

$$\frac{x^3 - 4x^2 + 3x}{x^2 - 12x + 35} = 0.$$

- ☐  $x = 0, 3$
- ☐  $x = 0, 1, 3$
- ☐  $x = 0, 3, 7$
- ☐  $x = 0, 2, 3$

8. Compute all the solutions to the equation

$$\frac{x^3 - 8x^2 + 20x - 16}{x^2 - 10x + 24} = 0.$$

- ☐  $x = 2$
- ☐  $x = 2, 3, 4$
- ☐  $x = 2$  (repeated), 4, 6
- ☐  $x = 2, 4$

9. Calculate all values of  $v$  such that

$$\frac{v^3 - 13v^2 + 54v - 72}{v^2 - 11v + 28} = 0.$$

- ☐  $v = 4$  (repeated), 6
- ☐  $v = 3, 4$  (repeated), 6
- ☐  $v = 3, 6$
- ☐  $v = 4, 6$

10. Find all the values of  $x$  such that

$$\frac{x^3 - 10x^2 + 21x}{x^2 - 7x + 10} = 0.$$

- ☐  $x = 0, 3, 5, 7$
- ☐  $x = 0, 3, 7$
- ☐  $x = 0, 3$
- ☐  $x = 0, 3, 8$

Difficulty level: Advanced

11. Find all the solutions to the equation

$$\frac{x^3 - 10x^2 + 25x}{x^2 - 3x + 2} = 0.$$

- ☐  $x = 0, 5$
- ☐  $x = 0, 5, 6$
- ☐  $x = 0, 5$
- ☐  $x = 0, 1, 5$  (repeated)

12. Find all the values of  $x$  such that

$$\frac{x^3 - 13x^2 + 56x - 80}{x^2 - 5x} = 0.$$

- ☐  $x = 4, 5$
- ☐  $x = 4$  (repeated),  $5$  (repeated)
- ☐  $x = 4, 5$  (repeated)
- ☐  $x = 4$

13. Find all the solutions to the equation

$$\frac{u^3 - 10u^2 + 28u - 24}{u^2 - 8u + 15} = 0.$$

- ☐  $u = 2$  (repeated)
- ☐  $u = 2$  (repeated),  $5, 6$
- ☐  $u = 2, 6$
- ☐  $u = 2$  (repeated),  $7$

14. Calculate all values of  $u$  such that

$$\frac{u^3 - 10u^2 + 25u}{u^2 - 8u + 12} = 0.$$

- ☐  $u = 5$  (repeated)
- ☐  $u = 0, 5$
- ☐  $u = 0, 2, 5$  (repeated)
- ☐  $u = 1, 5$  (repeated)

15. Find all the values of  $x$  such that

$$\frac{x^3 - 14x^2 + 61x - 84}{x^2 - 9x + 14} = 0.$$

- ☐  $x = 3, 7$
- ☐  $x = 3, 4$
- ☐  $x = 2, 3, 7$
- ☐  $x = 3, 5, 7$

16. Compute all the solutions to the

$$\text{equation } \frac{m^3 - 12m^2 + 47m - 60}{m^2 - 5m} = 0.$$

- ☐  $m = 3, 4$
- ☐  $m = 4, 5$
- ☐  $m = 0, 4, 5$
- ☐  $m = 4$  (repeated), 5

17. Compute all the solutions to the

$$\text{equation } \frac{z^3 - 6z^2 + 8z}{z^2 - 6z + 9} = 0.$$

- ☐  $z = 0, 2$
- ☐  $z = 0, 2, 4$
- ☐  $z = 0, 2, 5$
- ☐  $z = 3$  (repeated)

18. What are all the values of  $x$  such that

$$\frac{x^3 - 14x^2 + 60x - 72}{x^2 - 8x + 16} = 0?$$

- ☐  $x = 2, 6$
- ☐  $x = 4$  (repeated)
- ☐  $x = 2, 6, 7$
- ☐  $x = 2, 6$

19. Solve the equation  $\frac{a^3 - 6a^2 + 8a}{a^2 - a} = 0$   
for  $a$ .

- ☐  $a = 2, 4$
- ☐  $a = 0, 1$
- ☐  $a = 1, 2, 4$
- ☐  $a = 0, 2, 4$

20. Calculate all values of  $v$  such that

$$\frac{v^3 - 14v^2 + 61v - 84}{v^2 - 6v} = 0.$$

- ☐  $v = 0, 3, 4, 7$
- ☐  $v = 4$  (repeated), 7
- ☐  $v = 4, 7$
- ☐  $v = 3, 4, 7$