

1. B $5 - 8 \div 4 + 3 - 4 \div 2 \rightarrow 5 - 2 + 3 - 2 = 4$
2. C
3. D $-7 < 4 - 2x < 7 \rightarrow -11 < -2x < 3 \rightarrow x > -\frac{3}{2}$ and $x < \frac{11}{2}$.
The sum of the integral solutions is $-1 + 1 + 2 + 3 + 4 + 5 = 14$.
4. C $2(2x + 5)(4x^2 - 10x + 25) \rightarrow 4 - 10 + 25 = 19$
5. D $f(-x) = (-x)^5 + 1 = -x^5 + 1$
6. A 1, 1, 2, 3, 5, 8, 13, 21, 34,
7. C $140 \div 8 = 17r4 \rightarrow 17 \div 8 = 2r1 \rightarrow 2 \div 8 = 0r2$
8. A Consistent: has a solution. Dependent: the solution lies on the entire line.
9. B $f(1) = 0 \rightarrow 0 = (1)^4 + 2(1)^3 - (1)^2 + c(1) + k \rightarrow -2 = c + k$
 $f(-1) = 0 \rightarrow 0 = (-1)^4 + 2(-1)^3 - (-1)^2 + c(-1) + k \rightarrow 2 = -c + k$
10. A Sum = $-\frac{b}{a} : \frac{h}{3} = -12 \rightarrow h = -36$ Product = $\frac{c}{a} : \frac{4k}{3} = 20 \rightarrow k = 15$
11. C $\frac{\sqrt{5} + \sqrt{3}}{6} \cdot \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} - \sqrt{3}} = \frac{1}{3(\sqrt{5} - \sqrt{3})}$
12. A. $\sqrt[6]{27} = \sqrt[6]{3^3} = 3^{1/2}$ $\sqrt[4]{9} = \sqrt[4]{3^2} = 3^{1/2}$
13. C $(x - 5 - 6y)(x - 5 + 6y)$
14. A $.12A + .60B = .50(24) \rightarrow 12A + 60B = 1200 \rightarrow A = 5, B = 19$
 $A + B = 24 \rightarrow A + B = 24$
15. C $g(x) = f^{-1}(x) = \frac{1}{3}x - \frac{2}{3}$
16. D Inverse does not exist where determinant is 0.
17. C $z = \frac{\begin{vmatrix} 1 & 3 & 2 \\ 2 & 1 & 5 \\ 1 & 1 & 3 \end{vmatrix}}{\begin{vmatrix} 1 & 3 & 2 \\ 2 & 1 & 1 \\ 1 & 1 & 1 \end{vmatrix}} = \frac{-3}{-1} = 3$
18. A $Bx + B - Ax + 2A = 2x + 8 \rightarrow \begin{matrix} x(B - A) = 2x \\ B + 2A = 8 \end{matrix} \rightarrow \begin{matrix} B - A = 2 \\ B + 2A = 8 \end{matrix} \rightarrow A = 2, B = 4$
19. B $\frac{45}{99} = \frac{15}{33} = \frac{5}{11} \rightarrow 5 - 11 = -6$
20. B $\bar{z} = 2 + 5i$ and $|2 - 5i| = \sqrt{2^2 + 5^2} = \sqrt{29}$
21. B Let $x = \log 4$ and $y = \log 25$. Using substitution and then factor, we get $(x + y)^3 \rightarrow (\log 4 + \log 25)^3 = 8$.
22. B $4(x^2 - 4x + (-2)^2) + 4\left(y^2 + y + \left(\frac{1}{2}\right)^2\right) = 31 + 16 + 1 \rightarrow (x - 2)^2 + \left(y + \frac{1}{2}\right)^2 = 12$
Area = 12π
23. C $2 - \log_2(x - 2) = -1 + \log_2 x \rightarrow 3 = \log_2 x + \log_2(x - 2) \rightarrow x^2 - 2x - 8 = 0 \rightarrow x = -2, 4$

24. A $\frac{x+1}{x} \cdot \frac{x}{1-x^2} = \frac{1}{1-x} \rightarrow \frac{1}{y}$
25. D $g(x) = \frac{(x+1)(x-1)(x-1)}{(x+1)(x-1)} = x-1$
26. D $f(c+d) = b^{c+d} \rightarrow b^c \cdot b^d$
27. C $(1\#2) = 1^2 + 2 = 3 \rightarrow (3\#3) = 3^3 + 3 = 30$
28. B Let $y = 3^x$, $y^2 - 4x + 3 = 0 \rightarrow (y-3)(y-1) = 0 \rightarrow 3^x = 3 \text{ and } 3^x = 1 \rightarrow x = 0, 1$
29. D $\left(\frac{2^{1+\sqrt{2}}}{2^{1-\sqrt{2}}}\right)^{\sqrt{2}} = \left(\frac{2^{\sqrt{2}+2}}{2^{\sqrt{2}-2}}\right) = \frac{2^{\sqrt{2}} \cdot 2^2}{2^{\sqrt{2}} \cdot 2^{-2}} = 2^4 = 16$
30. D $\frac{(n+1)!}{3!(n-2)!} = \frac{2n!}{2!(n-2)!} \rightarrow (n+1)! = 6n! \rightarrow (n+1)n! = 6n! \rightarrow n+1 = 6 \rightarrow n = 5$