

For #'s 1-4 Factor completely. Show all steps.

| | |
|---|---|
| 1. $n^2 - 8n - 9$ | 2. $4x^3 + 12x^2 - 16x$ |
| 3. $3a^4 - 75b^2$ | 4. $3n^2 - 48n + 144$ |
| 5. Simplify: $(3-5i) - (-1-i)$ | 6. Simplify: $(2+3i)(-3-5i) =$ |
| 7. Simplify i^{113} | 8. Simplify $\frac{i^3}{i^{109}}$ |
| 9. Solve: $x^2 - 12 = -18$ | 10. Solve: $-3x^2 - 18 = 18$ |
| 11. Simplify: $3\sqrt{48} + 5\sqrt{27} - 2\sqrt{243} =$ | 12. Simplify: $\sqrt{-2} \times \sqrt{-72} =$ |

Solve the following by any means

13. $n^2 - 70n - 144 = 0$

14. $n^2 - 7n + 15 = 0$

15. $2x^2 + 6x + 11 = 0$

16. $5x^2 + 12x + 3 = 0$

17. Solve # 15 by completing the square.

18. Put #15 in vertex form.

19. What is the vertex for #14?

20. Find the vertex of $x^2 + 6x - 16 = 0$ using 3 different methods.

21. Without solving determine the type of solutions expected.

a) $3x^2 + 9x + 16 = 0$

b) $-x^2 - 9x - 16 = 0$

c) $x^2 + 9x - 10 = 0$

22. Provide a detailed graph for the problems in #21.