Finding Polynomial Roots Review

...e by factoring.

1. $100x^2 - 36 = 0$

$X = \frac{-6}{10}, \frac{6}{10} \rightarrow \frac{\pm 3}{5}$

2. $64x^2 - 1 = 0$

$X = -\frac{1}{8}, \frac{1}{8}$

3. $81x^2 - 400 = 0$

$X = -\frac{20}{9}, \frac{20}{9}$

4. $121 - 16x^2 = 0$

$X = -\frac{11}{4}, \frac{11}{4}$

5. $x^2 + 17x + 42 = 0$

$X = -3, X = -14$

6. $x^2 - 26x + 48 = 0$

$X = 24, X = 2$

7. $x^2 + 5x - 104 = 0$

$X = 8, X = -13$

8. $2x^2 - 8x - 120 = 0$

$X = 10, X = -6$

9. $7x^2 - 40x - 12 = 0$

$X = 6, X = -\frac{2}{7}$

10. $3x^2 + 20x - 32 = 0$

$X = \frac{4}{3}, X = -8$

11. $6x^2 + 23x - 4 = 0$

$X = \frac{1}{6} \quad X = -4$

12. $5x^2 - 3x - 36 = 0$

$X = 3, X = -\frac{12}{5}$

Divide, using the method of your choice.

13. $(-2x^2 + 35) \div (x - 4)$

$-2x - 8 + \frac{3}{x-4}$

14. $\frac{20y^3+23y^2-13y+9}{5y^2-3y+2}$

$4y + 7 + \frac{-5}{5y^2-3y+2}$

15. $\frac{x^3+x^2-10x+13}{x-2}$

$x^2 + 3x - 4 + \frac{5}{x-2}$

Unit 1 (6.4)

16. $(x^3 - 27) \cdot (x - 3)^{-1}$

x^2+3x+9

17. $(2x^3 + 5x^2 - 2x - 15) \div (2x - 3)$

x^2+4x+5

18. $\frac{x^4-3x^3+5x-6}{x+2}$

$x^3-5x^2+10x-15+\frac{24}{x+2}$

19. $\frac{2x^4-x^3+x^2+x-3}{x^2-1}$

$2x^2-x+3$

20. $(x^3 - x^2 - 6) \cdot (x + 2)^{-1}$

$x^2-3x+6+\frac{-18}{x+2}$

21. $(3x^4 + 5x^3 - 61x^2 + 95x - 42) \div (x^2 + 5x - 6)$

$3x^2-10x+7$

22. $\frac{4x^3+29x^2+45x-50}{x+5}$

$4x^2+9x+\frac{-50}{x+5}$

Unit 1 (6.4)

23. Given that $x + 3$ is a factor of $x^3 + 6x^2 + 11x + 6$, find the other roots.

$x = -3, -2, -1$

24. Given that $x - 1$ is a factor of $2x^3 - 5x^2 - 17x + 20$, find the other roots.

$x = 1, 4, -\frac{5}{2}$

25. Given that $x = 3$ is a root of $x^3 - 6x^2 + 14x - 15$, find the other roots.

$x = 3$

$x = \frac{3 \pm i\sqrt{11}}{2}$

26. Given that $x = -1$ and $x = 2$ are roots of $x^4 - 2x^3 + x^2 - 4$, what are the other roots?

$x = -1$

$x = 2$

$x = \frac{1 \pm i\sqrt{7}}{2}$

Unit 1 (6.4)

27. Given that $x = 4$ and $x = -3$ are roots of $x^4 - 15x^3 + 132x^2 + 38x - 1560$, what are the other roots?

$x = +4$

$x = -3$

$x = 7 \pm 9i$

or

$\frac{14 \pm 18i}{2}$

Use your graphing calculator and synthetic division to find the roots of the function.

28. $f(x) = x^4 - 7x^3 + 13x^2 + x - 20$

$x = -1$

$x = 4$

$x = 2 \pm i$

or

$\frac{4 \pm 2i}{2}$

29. $f(x) = x^4 - 5x^2 - 36$

$x = -3$

$x = 3$

$x = \pm 2i$

30. $f(x) = x^3 - 10x^2 + 18x - 4$

$x = 2$

$x = \frac{8 \pm 2\sqrt{14}}{2}$ or $4 \pm \sqrt{14}$

31. $f(x) = 2x^4 + 7x^3 - 2x^2 - 19x - 12$

$x = -3$

$x = -1$

$x = \frac{1 \pm \sqrt{33}}{4}$

32. $f(x) = x^4 - 4x^3 + x^2 + 16x - 20$

$x = -2$

$x = 2$

$x = \frac{4 \pm 2i}{2}$

or

$2 \pm i$

33. $f(x) = 4x^4 + 5x^3 + 30x^2 + 45x - 54$

$x = -2$

$x = \frac{3}{4}$

$x = \pm 3i$

34. The width of a box is 3 times the length. The height is 2 inches less than the length. The volume is 1152 in^3. Find the dimensions of the box.

8 x 24 x 6

35. A box measures $19in$ x $29in$ x $16in$. You would like to decrease each dimension by a small amount in order to reduce the volume to 92 more than half the original. How much should you take off of each side? What are the new dimensions?

15 x 25 x 12

36. The length of a box is 3 more than twice the height. The width is 4 inches less than the height. The volume is 357 in^3. Find the dimensions of the box.

17 x 3 x 7

37. A box measures $11in$ x $24in$ x $15in$. You would like to increase each dimension by a small amount so that the new volume is 1170 less than three times the original. How much should you add to each side? What are the new dimensions?

17 x 30 x 21