

Name _____

Review Packet for Incoming EFA (Elementary Function Analysis)

EFA primarily covers advanced algebra content. It is essential that all students complete the problems and review the concepts in this packet. All work must be included with the solutions for this packet to be accepted.

SHOW ALL WORK!

Simplify each expression and eliminate any negative exponents:

1. $(2x)^4x^3$

2. $(-3y)^3$

3. $(3x)^2(6x^2)^{-3}$

4. $(2x^2)^{-5}x^{10}$

5. $b^4\left(\frac{1}{3}b^2\right)(12b^{-8})$

6. $\frac{(2x^3)^2(3x^4)}{(x^3)^4}$

7. $\frac{c^4d^2}{cd^2} \cdot \frac{(d^2)^3}{(c^3)^2}$

8. $(3ab^2)\left(\frac{2a^2b}{c^3}\right)^{-2}$

9. $\left(\frac{a^{-1}bc^{-2}}{a^{-5}bc^{-8}}\right)^{-1}$

10. $\left(\frac{xy^{-2}z^{-3}}{x^2y^3z}\right)^{-3}$

Simplify each expression. Express each answer in standard radical form.

11. $\sqrt{54xy^4}$

12. $\sqrt[3]{16x^5}$

13. $5\sqrt{x} - 3\sqrt{x} + 6\sqrt{y}$

14. $2\sqrt{50} + 12\sqrt{8}$

15. $(5 + 2\sqrt{3})(5 - 2\sqrt{3})$

16. $(2 - \sqrt{3})(3 - \sqrt{6})$

Rationalize the denominator and simplify:

17. $\frac{2}{\sqrt{6}}$

18. $\frac{5}{3+\sqrt{3}}$

Perform the indicated operations. Write the resulting polynomial in standard form.

19. $-3^2 - (-4x)^2$

20. $(3x + 1)^2$

21. $8(2x + 5) - 2(4x + 8)$

22. $x^2(2x^3 - 4x^2 - 8x + 9)$

23. $(x^2 + a)(x^2 - a)$

24. $(x + 2y)(x - 3y)$

25. $(x^3 + 6x^2 - 4x - 2) - (8x + 3x^2 - x^3 - 2)$

26. $(x + 1)(x^2 + 2x + 1)$

27. $(x - 2)^3$

Factor each expression completely.

28. $12x^3 + 18x$

29. $x^2 - 2x - 8$

30. $9x^2 - 36$

31. $2x^2 + 5x + 3$

$$32. 8x^2 + 10x + 3$$

$$33. 2x^3 + x^2 - 6x - 3$$

$$34. -9x^3 - 3x^2 + 3x + 1$$

Simplify each expression:

$$35. \frac{2x^3 - x^2 - 6x}{2x^2 - 7x + 6}$$

$$36. \frac{y^2 - 3y - 18}{2y^2 + 5y + 3}$$

$$37. 2 + \frac{12x}{x+3}$$

$$38. \frac{4x}{x^2-4} - \frac{x-2}{x+2}$$

For each set of ordered pairs, find the slope of the line that connects them, the midpoint of the segment that they form, and the distance between them:

39. $(-2,5)$ and $(3,5)$

Slope:

Midpoint:

Distance:

40. $(-1,4)$ and $(3,-2)$

Slope:

Midpoint:

Distance:

Describe the transformations applied to $y = x^2$:

41. $y = -\frac{1}{2}x^2$

42. $y = (x - 7)^2$

43. $y = 4(x + 2)^2 - 1$

Solve each quadratic equation by factoring and the Zero Product Property:

44. $x^2 + 5x - 24 = 0$

45. $4x^2 - 4x - 15 = 0$

$$46. x^2 + 3x = 4$$

$$47. 4x^2 - x = 0$$

$$48. x^2 = 4(x - 1)$$

Solve each equation by using the Quadratic Formula. Express all answers in their **exact** form AND **round** solutions to the nearest hundredth.

$$49. x^2 + 2x - 5 = 0$$

$$50. 2x^2 + 8x + 1 = 0$$

$$51. 3x^2 - 6x - 1 = 0$$

$$52. 4x^2 - 12x = -9$$

$$53. 3x^2 - 5x = 1$$