

MATH095- FINAL EXAM

Factor COMPLETELY when possible. If the polynomial is prime, say so.

1. $X^2 - 3XY - 54Y^2$

1. _____

2. $81a^2 + 4b^2$

2. _____

3. $10M^4 - 25M^2 + 20MN$

3. _____

4. $28X^3 + 8X^2 + 49X + 14$

4. _____

5. $8X^2 + 17X - 21$

5. _____

6. $10Y^2 + 11Y - 6$

6. _____

7. $6T^2 + 5ST - 6S^2$

7. _____

8. $64X^3 - 27Y^3$

8. _____

Solve each equation for the given variable

9. $y(5y + 13) = 6$

9. _____

10. $4T^2 - 32T + 60 = 0$

10. _____

11. $X^3 + 6X^2 - X - 6 = 0$

11. _____

12. $4X(X + 2) = (3X - 3)(x + 2)$

12. _____

Solve the following problems

13. The length of a rectangular storage room floor is 5 feet longer than its width. If the area of the floor is 66 square feet, find its dimensions.

13. _____

14. If $h = -16t^2 + 192t$ represents the height of a firework, in feet, t seconds after it was fired, when will the firework be 576 feet high?

14. _____

15. A manufacturer determines that the [profit in dollars for manufacturing n units is $P = 2n^2 - 70n + 20$. Assume n is a positive integer. How many nits must be produces to create a profit of \$420?

15. _____

16. Find the domain of $f(x) = \frac{7x-5}{3x^2-13x-10}$

16. _____

Simplify each rational expression:

17 $\frac{x^2 - 3xy - 10y^2}{x^2 + 7xy + 10y^2}$

17. _____

$$18. \frac{(16X^2-9)}{(15X^2+25X)} \cdot \frac{(30X^3-15X^2)}{(8X^2+2X-2)}$$

18. _____

$$19. \frac{X^2+X-6}{X^2-2X-15} \div \frac{X^2+2X-8}{X^2-X-20}$$

19. _____

$$20. \left(\frac{8x^2-10x-3}{-2x^2-8x} \cdot \frac{x^2+x}{16x^2-1} \right) \div \frac{(-10x-15)}{8x^5}$$

20. _____

Add or subtract:

$$21. \frac{Y+5}{Y-4} - \frac{Y+3}{Y+7}$$

21. _____

$$22. \frac{(X-2)}{X^2-X-2} - \frac{4}{X^2-1} + \frac{4X+2}{X^2-3X+2}$$

22. _____

Simplify:

$$23. \frac{\frac{25x^2-4}{5x^3y^7}}{\frac{(5X+2)}{25x^4y^9}}$$

23. _____

$$24. \frac{\left(\frac{7}{2X^2} - \frac{5X}{6X^3}\right)}{\left(\frac{3X}{2} + \frac{7}{3X^2}\right)}$$

24. _____

Solve each rational equation

$$25. \frac{(2T-5)}{T+3} = \frac{(2T+9)}{T-7}$$

25. _____

$$26. \frac{Y-4}{Y+1} + \frac{Y+1}{Y-4} = \frac{13Y}{Y^2-3Y-4}$$

26. _____

$$27. \frac{x-2}{x^2-2x-3} + \frac{x+5}{x^2-1} = \frac{4x+3}{x^2-4x+3}$$

27. _____

Simplify the expression

28. $\sqrt{72a^5bc^{12}}$

28. _____

29. $7\sqrt{3x^2} - \sqrt{5y} - 4\sqrt{5y} + 9\sqrt{7x^2}$

29. _____

30. $\sqrt{4y^3}(\sqrt{8y^4} - 7\sqrt{y^3})$

30. _____

31. $(7\sqrt{x} - 2\sqrt{y})(7\sqrt{x} + \sqrt{y})$

31. _____

Rationalize the denominator in each expression below

32. $\frac{8}{5\sqrt{7b}}$

32. _____

33. $\frac{7}{(\sqrt{3} + \sqrt{5})}$

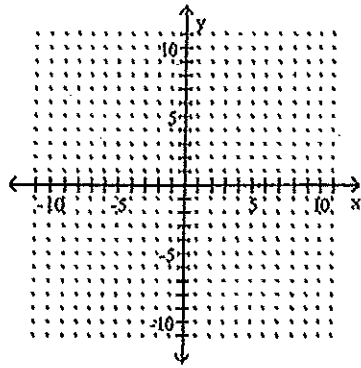
33. _____

34. $\frac{(2\sqrt{y}-7)}{(3\sqrt{y}+2)}$

34. _____

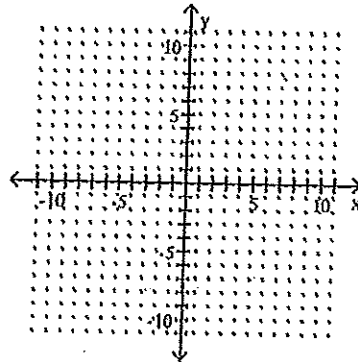
35. Graph the function by hand. Make your own grid below.

$$f(x) = -2\sqrt{x+5}$$



36. Graph the function by hand. Make your own grid below.

$$f(x) = \sqrt{x+1} + 3$$



Solve each equation:

37. $7 - 8\sqrt{2x - 1} = -17$

37. _____

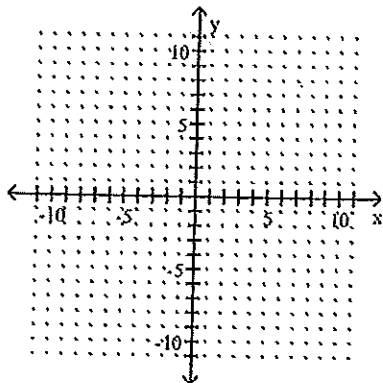
38. $2\sqrt{x - 1} - \sqrt{3x - 1} = 0$

38. _____

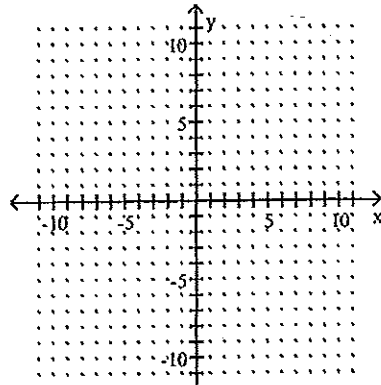
39. $\sqrt{3t - 1} - \sqrt{4t + 1} = -1$

39. _____

40. Sketch the graph of the function. $f(x) = -2(x - 6)^2 - 2$

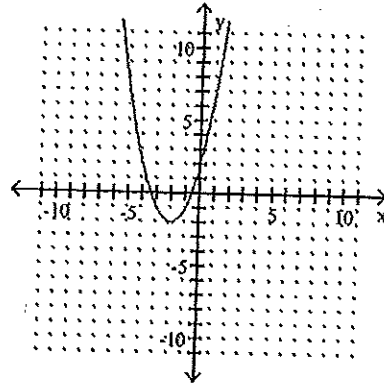


41. Sketch the graph of the function. $-(x + 1)^2 + 4$

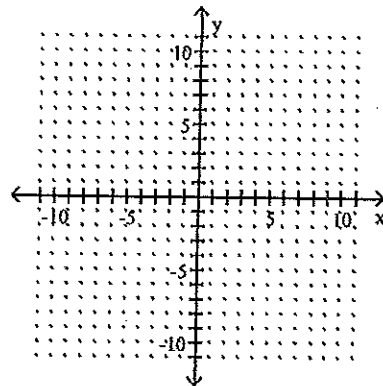


42. Find an equation of the function sketched below in the form:

$$f(x) = a(x - h)^2 + k$$



43. Sketch by hand the graph of the function. Give the coordinates for the vertex. $f(x) = x^2 + 2x + 5$



44. A developer wants to enclose a rectangular grassy lot that borders a city street for parking. If the developer has 280 feet of fencing and does not fence along the street, what is the largest area that can be enclosed.

45. solve: $(2x + 5)^2 = 6$

46. Solve: $(x + \frac{5}{2})^2 = \frac{10}{16}$

47. Solve by completing the square: $x^2 + 3x - 9 = 0$

48. Solve by completing the square: $6x^2 + 6x + 7 = 6$

49. Solve using the quadratic formula: $-3x^2 + 2x = -4$

50. Solve using the quadratic formula: $-8x^2 = -5x + 1$