

Second Semester Final Exam Review

1. Add: $(x^2 - 2x - 11) + (6x^2 - 5x + 4)$
2. Subtract: $(5x^2 - 8x - 4) - (4x^2 - 3x + 9)$
3. Simplify: $18x - 11x^2 - 10x - 15 - 22x^2$
4. Add: $(7x^3 + x^2 + 15) + (-4x - 6x^2 - 14)$
5. Multiply: $-3(4x^2 - 9x - 6)$
6. Multiply: $4x^2(-2x^2 + 3x - 8)$
7. Multiply: $(x - 9)(x + 6)$
8. Multiply: $(3x - 5)(4x + 7)$
9. Multiply: $(3x - 4)(x^2 - 2x + 8)$
10. Multiply: $(x - 7)^2$
11. Multiply: $(3x + 4y)^2$
12. Find the Greatest Common Factor of :
 $54x^2 - 36x$
13. Find the Greatest Common Factor of :
 $9x^4 + 12x^3 - 24x^2$
14. Factor: $24x^4 - 16x^3$
15. Factor: $a^2 - 144$
16. Factor: $x^2 + 8x - 20$
17. Factor: $5x^2 + 4x - 6$
18. Factor: $x^2 - 6x - 16$
19. Factor the following: $25x^2 - 81$
20. Simplify: $\sqrt{49}$
21. Simplify: $\sqrt{27}$
22. Simplify: $\sqrt{48x^2}$
23. Solve: $6x^2 = 54$
24. Solve: $(x - 3)^2 = 25$
25. Use the zero product property to solve:
 $(4x + 9)(x - 8) = 0$
26. Solve: $x^2 + 11x + 28 = 0$
27. What are the solutions for the quadratic equation
 $x^2 + 5x = 14$?
28. Solve: $x^2 - 8x - 48 = 0$
29. Solve: $16x^2 - 121 = 0$
30. Use the Quadratic Formula to solve the equation:
 $x^2 - 4x + 2 = 0$

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31. Solve: $x^2 + 7x - 3 = 0$

32. Solve: $3x^2 - 2x + 7 = 0$

33. Find the solutions to the equation: $5x^2 + x - 1 = 0$?

34. Maggie is solving the following equation by completing the square. What should her next step be?

$$x^2 + 6x - 12 = 0$$

$$x^2 + 6x = 12$$

$$x^2 + 6x + 9 = 12 + 9$$

$$(x + 3)^2 = 21$$

35. What number should be added to the expression in order to complete the square?

$$x^2 + 12x + \underline{\hspace{2cm}}$$

36. Graph: $y = -x^2 + 6$?

37. Determine the vertex for the graph of $y = x^2 - 10x + 4$

38. Determine the x-intercept(s) for the graph of $y = x^2 + 9x + 8$

39. Determine the roots for the graph of $y = x^2 - 6x - 55$

40. Determine the y-intercept for the graph of $y = 2x^2 + 8x - 11$

41. Graph: $y = x^2 - 8x + 12$

42. Simplify: $\frac{12(x-6)^4}{32(x-6)}$

43. What is $\frac{x^2 - 12x + 36}{x^2 - 2x - 24}$ reduced to lowest terms?

44. Simplify: $\frac{8x-16}{x^2-4}$

45. Perform the indicated operation and simplify.

$$\frac{x^2 - 2x}{x^2 + 5x} \cdot \frac{x}{x - 2}$$

46. $\frac{x^2 + 4x + 4}{2x - 5} \div \frac{7x + 14}{4x^2 - 25} =$

47. Add

$$\frac{5x}{x^2 + 8x + 12} + \frac{7x}{x^2 + 8x + 12}$$

48. Solve $5 + \frac{4}{x} = \frac{6}{x} + 3$

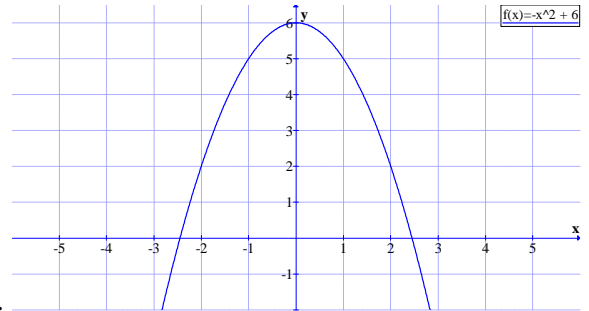
49. Solve $\sqrt{x-8} = 20$

50. Solve the following equation for x:
 $\sqrt{3x-5} - 5 = -3$

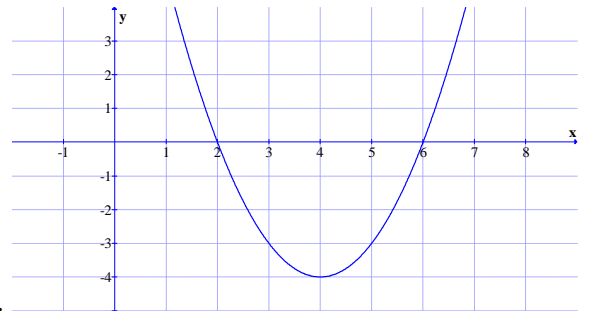
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Solutions:

1. $7x^2 - 7x - 7$
2. $x^2 - 5x - 13$
3. $-33x^2 + 8x - 15$
4. $7x^3 - 5x^2 - 4x + 1$
5. $-12x^2 + 27x + 18$
6. $-8x^4 + 12x^3 - 32x^2$
7. $x^2 - 3x - 54$
8. $12x^2 + x - 35$
9. $3x^3 - 10x^2 + 32x - 32$
10. $x^2 - 14x + 49$
11. $9x^2 + 24xy + 16y^2$
12. $18x$
13. $3x^2$
14. $8x^3(3x - 2)$
15. $(a + 12)(a - 12)$
16. $(x + 10)(x - 2)$
17. $(5x + 6)(x - 1)$
18. $(x - 8)(x + 2)$
19. $(5x + 9)(5x - 9)$
20. 7
21. $3\sqrt{3}$
22. $4x\sqrt{3}$
23. $x = \pm 3$
24. $x = 8$ or -2
25. $x = -\frac{9}{4}$ or 8
26. $x = -7$ or -4
27. $x = -7$ or 2
28. $x = 12$ or -4
29. $x = \pm \frac{11}{4}$
30. $2 \pm \sqrt{2}$
31. $\frac{-7 \pm \sqrt{61}}{2}$
32. no real solution
33. $\frac{-1 \pm \sqrt{21}}{10}$
34. square root both sides
35. 36



- 36.
37. $(5, -21)$
38. -8 and -1
39. 11 and -5
40. -11



- 41.
42. $\frac{3(x-6)^3}{8}$
43. $\frac{x-6}{x+4}$
44. $\frac{8}{x+2}$
45. $\frac{x}{x+5}$
46. $\frac{(x+2)(2x+5)}{7}$
47. $\frac{12x}{x^2 + 8x + 12}$
48. $x = 1$
49. $x = 408$
50. $x = 3$