

On-Line Math 52 Final Exam Pre-Test

Answer each as indicated.

1. [Sec. 1.8, 1.9] Simplify: $3p - 6(p - 9) + p$
2. [Sec. 2.1-2.3] Solve for k: $\frac{5}{6}k = 30$
3. [Sec. 2.1-2.3] Solve for a: $-(3a + 1) + a = 2$
4. [Sec. 2.1-2.3] Solve for x: $\frac{x}{6} - 1 = \frac{2x}{3} - \frac{1}{2}$
5. [Sec. 2.5, 2.6] Solve the inequality and graph the result on a number line: $5x + 7 > 2x + 1$
6. [Sec. 2.5, 2.6] Solve the inequality and graph the result on a number line: $4 - 3x \geq -x - 6$

For all application problems, be sure to write each answer as a complete sentence.

7. [Sec 3.2, 3.3] Beatriz owns some shares of Apple stock and some shares of FedEx stock. By the end of the year, her two stock investments gained a total of \$3,500 in value. If her FedEx stock gained $\frac{3}{4}$ as much value as her Apple Stock, how much did each investment gain?
8. [Sec 3.2, 3.3] In a right triangle, the shortest side is 3 inches less than the middle side, and the longest side is 9 inches shorter than twice the middle side. If the perimeter is 36 inches, what is the length of each side?

For answers with exponents, be sure to write the answer with positive exponents only.

9. [Sec. 4.1] Simplify: $y^4 \cdot y^6$
10. [Sec. 4.1, 4.6] Simplify: $m^3 \cdot m^{-9}$
11. [Sec. 4.1] Simplify: $\frac{x^{10}}{x^2}$

12. [Sec. 4.1, 4.6] Simplify: $\frac{k^{-3}}{k^{-6}}$
13. [Sec. 4.1] Simplify: $(x^2)^5$
14. [Sec. 4.1, 4.6] Simplify: $(x^3)^{-4}$
15. [Sec. 4.1] Simplify: $\left(\frac{b^2}{3a}\right)^3$

Be sure to write all polynomial answers in descending order.

16. [Sec 4.2] Add: $(4x^3 + 2x^2 - 3x - 8) + (2x^3 - 3x + 8)$
17. [Sec 4.2] Subtract: $(4x^3 + 2x^2 - 3x - 8) - (2x^3 - 3x + 8)$
18. [Sec 4.3] Multiply: $2a^3(5a^2 - 4a + 1)$
19. [Sec 4.4] Multiply: $(2b - 1)(3b + 4)$
20. [Sec 4.5] Multiply: $(2x + 5)^2$
21. [Sec 4.7] Simplify and write in scientific notation: $(2.6 \times 10^6) \cdot (1.5 \times 10^{-13})$
22. [Sec 5.1] Divide: $\frac{12a^3b - 9a^2b^2 + 6ab}{3ab}$

For each factoring problem, be sure to factor completely, showing all factors in the answer. If a polynomial cannot be factored, then write "prime."

23. [Sec 5.2] Factor: $6a^2b - 12ab^2$
24. [Sec 5.2] Factor: $-12x^5 + 20x^3$
25. [Sec 5.3] Factor: $2ab^2 - 4b^2 + 5a - 10$
26. [Sec 5.3] Factor: $15x^3 - 20x^2 - 6x + 8$
27. [Sec 5.4] Factor: $5x^2 - 6x - 8$
28. [Sec 5.4] Factor: $10p^2 - 11p + 3$

29. [Sec 5.5] Factor: $x^2 + 11x + 24$
30. [Sec 5.5] Factor: $y^2 + 9y - 36$
31. [Sec 5.6] Factor: $y^2 - 36$
32. [Sec 5.6] Factor: $4y^2 + 25$
33. [Sec 5.6] Factor: $6a^3 - 54a$
34. [Sec 5.6] Factor: $3y^3 + 12y^2 - 15y$
35. [Sec 6.2] Divide using long division: $\frac{2x^2 - 7x + 7}{x - 3}$

For each rational expression, be sure to simplify the result completely.

36. [Sec 6.3] Multiply: $\frac{x^2 - x - 6}{2x^2 + 9x + 10} \cdot \frac{2x^2 + 15x + 25}{x^2 - 25}$
37. [Sec 6.4] Add: $\frac{1}{y^2 - 4y - 5} + \frac{y}{y^2 - 4y - 5}$
38. [Sec 6.4] Subtract: $\frac{4x + 3}{x^2 - x - 6} - \frac{x - 3}{x^2 - x - 6}$
39. [Sec 6.5] Subtract: $\frac{2x}{x^2 - 4} - \frac{1}{x + 2}$
40. [Sec 6.5] Add: $\frac{x + 2}{x^2 + x} + \frac{x + 4}{3x + 3}$

Answer each as indicated.

41. [Sec 7.1] Solve: $3x^2 + 8x = 0$
42. [Sec 7.1] Solve: $15x^2 - 7x - 2 = 0$
43. [Sec 7.1] Solve: $x^2 = 6x + 16$
44. [Sec. 7.3] Solve: $\frac{2}{3} + \frac{2}{p} = \frac{p+1}{3}$

45. [Sec. 7.3] Solve: $\frac{x^2 + 15}{x^2 + 3x} = \frac{6}{x + 3} + \frac{1}{x}$
46. [Sec 8.3] Find the slope of the line that passes through (4,-3) and (-5, 1).
47. [Sec 8.4] Identify the slope and y-intercept point of the line $y = \frac{2}{5}x - 3$. Graph the line.
48. [Sec 8.5] Write the equation of the line whose graph has slope $\frac{1}{4}$ and y-intercept at (0, 1).
49. [Sec 8.5] Write the equation of the line whose graph has slope -2 and passes through the point (8,1)
50. [Sec 8.6] Identify the slope and y-intercept point of the line $4x + 3y = 6$. Graph the line.
51. [Sec 8.6] Find the x-intercept and y-intercept of the line $4x - 5y = 20$. Graph the line.
52. [Sec 10.1] Simplify: $\sqrt{54}$
53. [Sec 10.2] Simplify and add: $2\sqrt{20} + \sqrt{45}$
54. [Sec 10.2] Rationalize the denominator and simplify: $\frac{10}{\sqrt{5}}$
55. [Sec 10.2] Rationalize the denominator and simplify: $\frac{\sqrt{3}}{\sqrt{6}}$
56. [Sec 10.3] Multiply and simplify: $(\sqrt{2} + 1)(\sqrt{2} - 3)$

On-Line Math 52

Final Exam Pre-Test Answers

1. $-2p + 54$
2. $k = 36$
3. $a = -\frac{3}{2}$
4. $x = -1$
- 5.* $x > -2$
- 6.* $x \leq 5$
7. Her Apple stock gained \$2,000 and her FedEx stock gained \$1,500.
8. The shortest side is 9 inches, the middle side is 12 inches, and the longest side is 15 inches.
9. y^{10}
10. $\frac{1}{m^6}$
11. x^8
12. k^3
13. x^{10}
14. $\frac{1}{x^{12}}$
15. $\frac{b^6}{27a^3}$
16. $6x^3 + 2x^2 - 6x$
17. $2x^3 + 2x^2 - 16$
18. $10a^5 - 8a^4 + 2a^3$
19. $6b^2 + 5b - 4$
20. $4x^2 + 20x + 25$
21. 3.9×10^{-7}
22. $4a^2 - 3ab + 2$
23. $6ab(a - 2b)$
24. $-4x^3(3x^2 - 5)$
25. $(2b^2 + 5)(a - 2)$
26. $(5x^2 - 2)(3x - 4)$
27. $(5x + 4)(x - 2)$
28. $(5p - 3)(2p - 1)$
29. $(x + 3)(x + 8)$
30. $(y + 12)(y - 3)$
31. $(y - 6)(y + 6)$
32. Prime
33. $6a(a - 3)(a + 3)$
34. $3y(y + 5)(y - 1)$
35. $2x - 1 + \frac{4}{x - 3}$
36. $\frac{x - 3}{x - 5}$
37. $\frac{1}{y - 5}$
38. $\frac{3}{x - 3}$
39. $\frac{1}{x - 2}$
40. $\frac{x + 6}{3x}$
41. $x = 0, \frac{-8}{3}$
42. $x = \frac{-1}{5}, \frac{2}{3}$
43. $x = -2, 8$
44. $p = -2, 3$
45. $x = 3, 4$
46. $m = \frac{-4}{9}$
- 47.* $m = \frac{2}{5}$; y-int = (0, -3)
48. $y = \frac{1}{4}x + 1$
49. $y = -2x + 17$
- 50.* $m = \frac{-4}{3}$; y-int = (0, 2)
- 51.* x-int = (5, 0), y-int = (0, -4)
52. $3\sqrt{6}$
53. $7\sqrt{5}$
54. $2\sqrt{5}$
55. $\frac{\sqrt{2}}{2}$
56. $-1 - 2\sqrt{2}$

* Graphs are on the next page.

