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Algebra 1 Practice Final *(continued)*

Factor each polynomial.

14. $12x^2z - 24x^4z + 16x^2z^3$

15. $m^2 + 12m - 28$

16. $3p^2 - 20p + 12$

17. $3x^5 - 75x^3$

18. The area of a square is $25x^2 + 70x + 49$ square inches. What is the length of the side of the square?

Solve each equation.

19. $10y^2 = -20y$

20. $y^2 = 13y - 42$

21. $m^2 + 64 = 16m$

22. Write the equation of the axis of symmetry, and find the coordinates of the vertex of the graph of $y = x^2 + 10x + 16$. Then graph $y = x^2 + 10x + 16$.

23. Find the value of c that makes $x^2 - 26x + c$ a perfect square trinomial.

24. State the value of the discriminant for $2x^2 + 5x + 2 = 0$.

25. Solve $5x^2 + 13x = 6$ by using the Quadratic Formula. Round to the nearest tenth if necessary.

(Chapters 10–12)

Simplify each expression.

26. $\sqrt{75y^4w^3}$

27. $\frac{3}{\sqrt{7} - 2}$

28. $3\sqrt{12} + \sqrt{27} - 2\sqrt{20}$

29. $(\sqrt{5} - 4)(\sqrt{5} + 4)$

14. $4x^2z(3 - 8x^2 + 4z^2)$

15. $(m + 14)(m - 2)$

16. $(p - 6)(3p - 2)$

17. $3x^3(x + 5)(x - 5)$

18. $(5x + 7)^2$

19. $y = 0, y = -2$

20. $y = 6, y = 7$

21. $m = 8$

22. A.O.S. $x = -5$ | Vertex $(-5, -14)$

23. $c = 169$

24. 9

25. $x = \frac{-13 \pm \sqrt{145}}{10}$

26. $5wy^2\sqrt{3w}$

27. $\sqrt{7} + 2$

28. $9\sqrt{3} - 4\sqrt{5}$

29. -9

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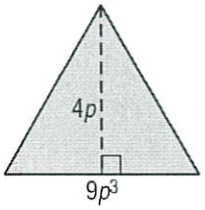
Algebra 1 Practice Final (I will be choosing 30 of these!)

(Chapters 7-9)

1. Express the area of the triangle as a monomial.



$\frac{1}{2}bh$

$\frac{1}{2}(9p^3)(4p) = 18p^4$

1. $18p^4$

2. Simplify $\frac{(3y^{-4}n^{-6})^{-2}}{(y^2n^{-3})^4}$ $= \frac{3^{-2}y^8n^{12}}{y^8n^{-12}} = \frac{n^{24}}{3^2}$

2. $\frac{n^{24}}{9}$

3. Solve $5^{x-2} = 125$. $x-2=3$

$5^{x-2} = 5^3$

3. $x = 5$

4. Solve $(7.5 \times 10^{-5})(3.2 \times 10^{7})$. Write your answer in both standard and scientific notation.

$24 \times 10^2 = 2400$

Standard scientific

4. 2400 or 2.4×10^3

5. The population of Las Vegas, Nevada has been increasing at an annual rate of 5.0%. If the population of Las Vegas was 386,575 in 1998, predict its population in 2016.

$a_0(1+r)^t = 386,575(1+.05)^{18}$

$a_0 = 386,575$, $t = 2016-1998 = 18$, $r = .05$

5. $386,575(1.05)^{18}$

6. A new motor home costs \$75,000. It is expected to depreciate 7% each year. Find the value of the motor home in 5 years.

$1-.07$

6. $75,000(.93)^5$

7. Write an equation for the nth term of the geometric sequence $-4, 8, -16, 32, \ldots$.

$a_n = 2(-2)^n$

7. $a_n = 2(-2)^n$

8. Find $(3c^2 - 8c + 5) - (c^2 - 8c - 6)$.

$3c^2 - 8c + 5 - c^2 + 8c + 6$

8. $2c^2 + 11$

9. Solve $x(x + 3) - 2 = 2 + x(x + 1)$.

$x^2 + 3x - 2 = 2 + x^2 + x$ $2x = 4$

$x = 2$

9. $x = 2$

Find each product.

10. $(x - 2)(x + 9)$ $x^2 + 7x - 18$

10. $x^2 + 7x - 18$

11. $(3x + 2)(4x^2 - 2x - 7)$. $12x^3 - 6x^2 - 21x + 8x^2 - 4x - 14$

11. $12x^3 + 2x^2 - 25x - 14$

12. $(4a^2 + b)^2$ $16a^4 + 8a^2b + b^2$

12. $16a^4 + 8a^2b + b^2$

13. $(3y + 4z)(3y - 4z)$

13. $9y^2 + 16z^2$

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Algebra 1 Practice Final

SCORE

30. Solve $\sqrt{3n + 1} + 3 = 7$

$\sqrt{3n+1} = 4$ $3n+1 = 16$ $3n = 15$ $n = 5$

30. $n = 5$

31. Determine whether side measures 7, 5, and $\sqrt{84}$ form a right triangle. Justify your answer.

$7^2 + 5^2 = \sqrt{84}^2$ $49 + 25 = 84$

31. Yes; $49 + 25 = 84$

32. Solve $\sqrt{5x + 39} = (x + 3)^2$

$5x + 39 = x^2 + 6x + 9$ $x^2 + x - 30 = 0$ $(x+6)(x-5) = 0$ $x = -6, 5$ extraneous ✓

$(x+3)(x+3)$ FOIL!

32. $x = 5$

33. Write an inverse variation equation that relates x and y if $y = 0.8$ when $x = 1.8$. Then find y when $x = 4.8$.

$xy = (1.8)(.8) = (4.8)$ $1.44 = 4.8y$

33. $y = .3$

34. Simplify $\frac{a^2 - 3a - 28}{a^2 + 3a - 4}$. State the excluded value(s) of x.

$\frac{(a-7)(x+4)}{(a+4)(a-1)}$ $a \neq -4, 1$ $\frac{a-7}{a-1}$

34.

Find each sum, difference, product or quotient.

35. $\frac{y^2 + 4y + 4}{y} \cdot \frac{9y}{y^2 - 4}$.

$\frac{(y+2)(y+2)}{y} \cdot \frac{9y}{(y+2)(y-2)} =$ $\frac{9(y+2)}{y-2}$

35.

36. $\frac{n^2 + 3n - 10}{n^2 + 6n + 8} \div \frac{n - 2}{n^2 + 2n}$.

$(n+5)(n-2)$ $(n+2)(n+4)$ $n(n+2)$

$\frac{(n+5)(n-2)}{(n+2)(n+4)} \cdot \frac{n(n+2)}{(n-2)} = \frac{n(n+5)}{(n+4)}$

36. $\frac{n(n+5)}{n+4}$

37. $\frac{2r - 3}{r - 5} + \frac{6r + 7}{r - 5}$

$\frac{2r - 3 + 6r + 7}{r-5}$

37. $\frac{8r+4}{r-5}$

38. $\frac{8}{(a - b)^2} - \frac{3b}{a^2 - b^2}$

$\frac{8}{(a-b)(a-b)} - \frac{3b}{(a-b)(a+b)}$ $8a + 8b - 3ab + 3b^2$ $8(a+b) - 3b(a-b)$ $= \frac{}{(a-b)(a-b)(a+b)}$

38. $\frac{3b^2 + 8b - 8a - 3ab}{(a-b)(a-b)(a+b)}$

39. Solve $\frac{x - 1}{x - 2} - \frac{7}{x + 3} = \frac{5}{x^2 + x - 6}$. State any extraneous solutions.

$(x-2)(x+3)$ $(x-1)(x+3) - 7(x-2) = 5$ $x^2 - x + 3x - 3 - 7x + 14 = 5$ $x^2 - 5x + 11 = 5$ $x^2 - 5x + 6 = 0$ $(x-2)(x-3) = 0$ $x = 2, 3$

extraneous (can't divide by zero...)

39. $x = 3$

40. Simplify $\frac{\frac{r^2 + 2r - 3}{r}}{\frac{r^2 + 3r}{r^2 - r}}$.

40. 11