

Algebra Review Worksheet and Answers
Algebra Exam – Wednesday, September 2nd

There are 30 problems on this worksheet. The answers are shown starting on page 4.

In problems 1-10, simplify each expression completely with a common denominator. (if applicable) Your final answer should not have any negative number exponents. Assume that $a, b,$ and c are parameters.

1. $\frac{3x}{x+1} - \frac{7x+2}{4x}$

6. $\frac{(a+8)^{x+1}}{(a+8)^{4x-2}} =$

2. $\frac{1+2t}{\sqrt{t+3}} + 2\sqrt{t+3}$

7. $\frac{(x^2+1)\frac{1}{2\sqrt{x}} - \sqrt{x}(2x)}{(x^2+1)^2}$

3. $\frac{2}{y+4} - \frac{3}{y-4}$

8. $\frac{4(z+2)^{1/2} - 2z(z+2)^{-1/2}}{z+2}$

4. $\frac{c^z 4^{z+2}}{4^z c^{z-2}}$

9. $b^{y-1} b^{1-y}$

5. $\frac{(x^3+1)^2 - 6x^3(x^3+1)}{(x^3+1)^4}$

10. $\frac{5}{\sqrt{1-z^2}} - 3\sqrt{1-z^2}$

In problems 11-20, solve the following equations for x , unless otherwise specified. Assume a, b , and c are parameters. Give **exact** solutions.

11. $\frac{(x+3)(x^2-5)}{x-2} = 0$

12. $3x^2 + x = 5$

13. $\frac{3x}{5} - \frac{2}{x} = \frac{1}{5}$

14. $\sqrt{x+9} - 2 = \sqrt{x-3}$

15. Solve for y : $-2ay + 5 = 9a - 4y$

16. $(x+5)(x-2) = 8$

17. Solve for z : $\frac{1+az}{z-2} = 4b$

18. $3^{x+5} = 9^{2x-7}$

19. Solve for y : $\frac{2}{a} + \frac{1}{y} = \frac{4}{c}$ (simplify your solution completely)

20. $\sqrt{(x+4)^2 + 3} = 5$

In problems 21-30, determine if each statement is true or false.

$$21. \sqrt{x^2 + 121} = x + 11$$

$$26. \frac{1}{x-4} = \frac{-1}{4-x}$$

$$22. \sqrt{4} = \pm 2$$

$$27. \frac{1}{a^{-1} + b^{-1}} = \frac{ab}{a+b}$$

$$23. \frac{\frac{w+1}{2}}{w+1} = \frac{1}{2}$$

$$28. 8(2t+1)^3 = (4t+2)^3$$

$$24. 2^{x+y} = 2^x + 2^y$$

$$29. (a-b)^3 = a^3 - b^3$$

$$25. \frac{1}{3t^4} = (3t)^{-4}$$

$$30. 2^x + 2^x = 2^{x+1}$$

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1. $\frac{5x^2 - 9x - 2}{4x(x+1)}$

2. $\frac{4t+7}{\sqrt{t+3}}$

3. $\frac{-y-20}{(y+4)(y-4)}$

4. $16c^2$

5. $\frac{-5x^3+1}{(x^3+1)^3}$

6. $(a+8)^{-3x+3}$

7. $\frac{-3x^2+1}{2\sqrt{x}(x^2+1)^2}$

8. $\frac{2z+8}{(z+2)^{\frac{3}{2}}}$

9. 1

10. $\frac{2+3z^2}{\sqrt{1-z^2}}$

11. $x = -3, \pm\sqrt{5}$

12. $x = \frac{-1 \pm \sqrt{61}}{6}$

13. $x = \frac{-5}{3}, 2$

14. $x = 7$

15. $y = \frac{9a - 5}{-2a + 4}$

16. $x = 3, -6$

17. $z = \frac{8b + 1}{4b - a}$

18. $x = \frac{19}{3}$

19. $y = \frac{ac}{4a - 2c}$

20. $x = -4 \pm \sqrt{22}$

21. False

22. False

23. True

24. False

25. False

26. True

27. True

28. True

29. False

30. True