Algebra Review Worksheet
Algebra Exam – Monday, November 5th

There are 40 problems on this worksheet.

In problems 1-20, simplify each expression completely. Your final answer should not have any negative number exponents. Also, all fractions must be in simplest form, i.e. no compound fractions.

In problems 21-40, solve the following equations for the indicated variable. Give **exact** answers.

1. $\dfrac{3}{y-7}+x$

2. $\dfrac{6}{z-5}-\dfrac{8}{5-z}$

3. $\dfrac{(a+5)^3-4a^2(a+5)}{(a+5)^4}$

4. $\dfrac{b^{-2}}{c^{-1}+b^{-1}}$

5. $\dfrac{\dfrac{36}{x}-x}{\dfrac{6}{x}+1}$

6. $\dfrac{\dfrac{c}{x+h}-\dfrac{c}{x}}{h}$

7. $\dfrac{\left(x^2+1\right)\dfrac{1}{2}x^{-\frac{1}{2}}-x^{\frac{1}{2}}(2x)}{\left(x^2+1\right)^2}$

8. $\dfrac{3(y-6)^{1/2}-2y(y-6)^{-1/2}}{y-6}$

9. $\dfrac{a^{2-t}b^{-3n}}{a^{t+1}b^{n}}$

10. $\dfrac{x^{(m-2)}x^4}{(x^m)^5}$

11. $2(n+7)^4 - 5(n+7)^3(n+6)$

12. $\left(e^4\right)^a \cdot e^a$

13. $\dfrac{4x^{-1}}{x^{-1}+4y^{-1}}$

14. $\dfrac{5x-x^2}{3x-15}$ for $x \neq 5$

15. $\sqrt{25}$

16. $\dfrac{\dfrac{3}{x+h}-\dfrac{3}{x-h}}{2h}$

17. $\log t - 2\log w + 3\log v$

18. $10^{(2+\log x)}$

19. $7^{2\log_7(x)}$

20. $2\ln(e^{\sqrt{x}})$

21. $5^{x+1} = \sqrt[3]{5}$

22. Solve for z: $\dfrac{z^2(3-z)}{z+1} < 0$

23. Solve for w: $|-7w+4|-6=-3$

24. Solve for x: $\frac{-2x}{9}-\frac{x}{4}=-3$

25. Solve for y: $7y(y-2)=1$

26. Solve for x: $x^{-2}+5x=0$

27. Solve for x: $x^{\frac{5}{3}}=32$

28. Solve for b: $5a(2+b)=4a^2b-3$

30. Solve for t: $-2at+3=7a-4t$

31. Solve for r: $N=3\pi\sqrt{\frac{M}{r}}$

32. Solve for k: $\sqrt{k^2-17}=9$

33. Solve for c: $\frac{c^2-7c-44}{c-2}=0$

34. Solve for y: $\ln(2-3y)=7$

35. Solve for k: $4^{(k+1)}=e^k$

29. Solve for x: $\log\left(\sqrt{12-x}\right) = \log(x)$

36. Solve for y: $e^{3-2y} = 17$

37. Solve for x: $7xe^{-3x} + 8x^2e^{-3x} = 0$

38. Solve for w: $2w^2e^w - 14w^5e^w = 0$

39. Solve for x: $3(\log x)^2 + 5\log x = 2$

40. Solve for x: $e^{\ln(2x+1)} = 2x + 1$