

Name (please print): _____

Fall 2007 Math 120, Section 6

Algebra Practice Worksheet

Instructions: Provide complete solutions to each of the problems below on separate paper

1. Perform the indicated operations and simplify:

$$\frac{\sqrt{x}(3x^2) - \frac{1}{2}x^{-1/2}(x^3 + 4)}{x}$$

2. Perform the indicated operations and simplify:

$$\frac{r^{-1} - 1}{\frac{4}{r^2} + 2} - \frac{r - 1}{r^2 + 2}$$

3. Solve for r :

$$S = 2\pi r^2 + \pi r h$$

4. Solve for a :

$$\frac{2a^2 - 3a - 2}{a + 7} = 0$$

5. Solve for y in terms of x :

$$1 + x^2y = 3x - 5xy$$

6. Solve for k :

$$3k - 24k^{-2} = 0$$

7. Simplify the following (do not leave any negative exponents in your final answer):

$$\frac{(y + 1)^{-1/2} - 3y^3(y + 1)^{1/2}}{y + 1}$$

8. Perform the indicated operations and simplify:

$$\frac{7 - t}{\sqrt{1 - t^2}} + 3\sqrt{1 - t^2}$$

9. Solve for t :

$$te^{at} - 3t^2e^{at} = 0$$

10. Simplify as much as possible:

$$\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

11. Solve for x :

$$\ln(ax - c) - 4 = 0$$

12. Simplify as much as possible:

$$\frac{(b + 1)^x}{(b + 1)^{2x-3}}$$

13. Simplify by condensing as much as possible:

$$3 \log_b(x) - 5 \log_b(y) + \frac{1}{2} \log_b(z).$$

14. Solve for y :

$$b + e^{ay} = b + 2$$

15. Solve for x :

$$2\sqrt{x + x^{-1}} = 1$$

16. Solve the following equation for λ :

$$\frac{\lambda - 1}{\lambda + 1} = x$$

17. Recall that the volume of a cylinder with radius r and height h is given by

$$V = \pi r^2 h.$$

If the radius of a given cylinder satisfies the relation $r = (1 - 2h)^{-1/2}$ then for what value of r (the **radius**) will the volume be 3?

18. **Determine if each statement is correct or incorrect**

A) $\frac{\ln M}{\ln N} = \ln M - \ln N$

B) $\frac{1}{\sqrt[3]{z-5}} = (z-5)^{-1/3}$

C) $\frac{1}{x^{-1}+1} = \frac{x}{x+1}$

D) $\frac{At^2+B}{t} = At+B$

E) $(-x^2)^3 = x^6$

F) $(x+3)^n = x^n + 3^n$

G) $\sqrt{y^2+64} = y+8$

H) $\frac{1}{4y^2} = (4y)^{-2}$

I) $(2x+4)^3 = 8(x+2)^3$

J) $5^{3 \log_5 x} = x^3$

K) $\ln 1 = e$