

Course: 110 Date: _____

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Show all of your work on this (or additional) sheets.

1. Simplify: $x^{-9}x^5$

$$x^{-9}x^5 = x^{-9+5} = \boxed{x^{-4}}$$

2. Simplify: $(x^{-3})^3$

$$(x^{-3})^3 = x^{-3 \cdot 3} = \boxed{x^{-9}}$$

3. Simplify: $(x^3x^5)^{-2}$

$$(x^3x^5)^{-2} = (x^{3+5})^{-2} = (x^8)^{-2} \\ = x^{8 \cdot -2} = \boxed{x^{-16}}$$

4. Simplify: $(x^2y)^3(x^{-1}y^3)$

$$(x^2y)^3(x^{-1}y^3) = x^6y^3x^{-1}y^3 \\ = x^{6-1}y^{3+3} \\ = \boxed{x^5y^6}$$

5. Simplify: $\left(\frac{64}{4}\right)^{1/2}$

$$= \frac{64^{1/2}}{4^{1/2}} = \frac{8}{2} = \boxed{4}$$

6. Assume $x, y, z > 0$. Rewrite the following with exponents to eliminate the square root: $\sqrt{x^{-4}y^2z^3}$

$$(x^{-4}y^2z^3)^{1/2} = \boxed{x^{-2}y^1z^{3/2}}$$

7. Simplify the following and get rid of all negative exponents: $\frac{xz^{-3}}{xy^{-2}z^{-5}}$

$$\frac{xz^{-3}}{xy^{-2}z^{-5}} = z^{-3}z^{+5}y^{+2} = \boxed{z^2y^2}$$

8. Simplify the following and get rid of all negative exponents: $\left(\frac{x^2y^3}{x^{-3}y^5}\right)^{-4}$

$$\frac{x^{-8}y^{-12}}{x^{12}y^{-20}} = x^{-8-12}y^{-12+20} = \boxed{x^{-20}y^8}$$

9. Solve for x : $4^{3x} = 16$

$$4^{3x} = 4^2 \Rightarrow \boxed{x = 2/3}$$

10. Solve for x : $2 = 18 - 4^{x+1}$

$$\begin{aligned} \cancel{4} 4^{x+1} &= 18 - 2 \\ 4^{x+1} &= 16 = 4^2 \\ \Rightarrow x+1 &= 2 \Rightarrow \boxed{x=1} \end{aligned}$$