

## WS Unit 9 Test Review

**Simplify. Your answer should contain only positive exponents.**

1)  $3x^{-4} \cdot 4xy^4$

2)  $(2xy^4)^4 \cdot (2xy^4)^{-1}$

3)  $(4u^4)^3$

4)  $\frac{(a^{-3}b^4)^2}{a^4b^{-2}}$

5)  $\frac{3x^3y^3}{4x^2y^{-3}}$

6)  $\left(\frac{2n^{-1}}{2m^{-1}n^2 \cdot 2mn^{-3}}\right)^{-2}$

**Simplify.**

7)  $\sqrt{8}$

8)  $\sqrt{288}$

9)  $\sqrt[4]{32}$

10)  $\sqrt[7]{-512}$

11)  $\sqrt[3]{1000}$

12)  $\sqrt[5]{256}$

**Write each expression in exponential form.**

13)  $(\sqrt{3})^5$

14)  $(\sqrt[3]{2})^5$

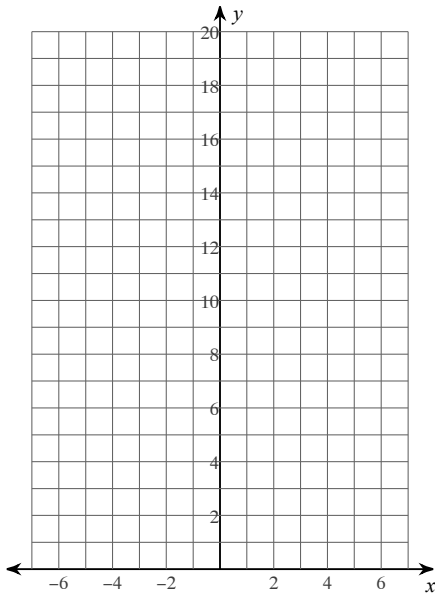
Write each expression in radical form.

15)  $5^{\frac{7}{4}}$

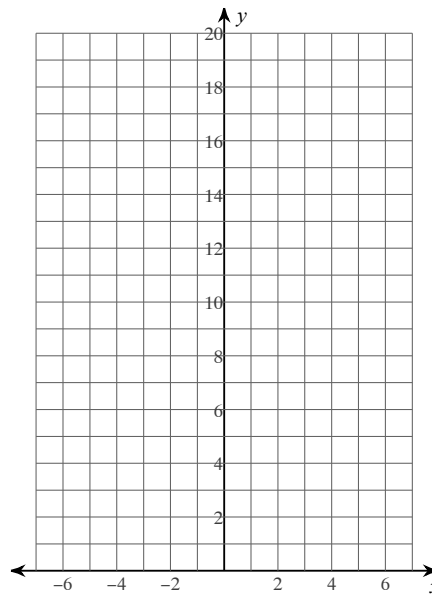
16)  $7^{\frac{1}{2}}$

Determine if the function represents exponential growth or decay. Then sketch the graph of each function.

17)  $y = 2 \cdot 3^x$



18)  $y = 2 \cdot \left(\frac{1}{2}\right)^x$



19) If you invest \$25,000 in an account that gets 12% annual interest compounded quarterly, how much would you have in 10 years.

20) If you invested a penny on Jan 1, 1998 at 10% interest compounded daily, how much would you have on Jan 1, 2020 ?

21) How much would you need to invest to get \$20,000 in 5 years at an annual interest rate of 8.5% compounded monthly?

22) An initial population of 5 squirrels increases by 9% each year for 10 years. Using  $x$  for years and  $y$  for the number of squirrels, write the equation that models this situation. How many squirrels will there be in 10 years?

23) A car purchased for \$34,000 is expected to lose value, or depreciate, at a rate of 6% per year. Using  $x$  for years and  $y$  for the value of the car, write the equation that models this situation. After how many years is the car first worth less than \$21,500?

**Solve each equation.**

24)  $3^{3n+1} = 3^3$

25)  $5^{-2n} = 5^{3n}$

26)  $2^{3x-2} = \frac{1}{16}$

27)  $6^{-y} = 36$

28)  $2^{-3x} = 16$

29)  $5^{-3n-2} = \frac{1}{625}$

30)  $7^{3k} = 343$

31)  $5^{-2x} = 125$