

## Exponential Functions

Date \_\_\_\_\_

**Simplify. Product and power. Keep the same base and include the exponent.**

1)  $3^0 \cdot 3^3 \cdot 3^2$

2)  $2^2 \cdot 2^3$

3)  $2 \cdot 2^3 \cdot 2^2$

4)  $9 \cdot 3^0$

5)  $(2^3)^3$

6)  $(3^3)^2$

7)  $(3^0)^0$

8)  $(2^2)^3$

**Simplify quotients. Your answer should contain only positive exponents. Keep the same base and include the exponent.**

9)  $\frac{3}{3^3}$

10)  $\frac{3}{3^2}$

11)  $\frac{2^2}{2}$

12)  $\frac{2^2}{2^3}$

**Variable bases. Simplify quotients. Your answer should contain only positive exponents.**

13)  $v^0 \cdot 3v^0$

14)  $x^3 \cdot 3x^0$

15)  $2k^{-1} \cdot 3k^3$

16)  $3r^0 \cdot r^2$

17)  $(x^3)^{-3}$

18)  $(2x^2)^0$

19)  $(2m^3)^{-1}$

20)  $(x^{-2})^{-1}$

21)  $\frac{2v^2}{3v^3}$

22)  $\frac{2x^0}{x^0}$

23)  $\frac{3x^3}{x}$

24)  $\frac{2x^{-1}}{x^3}$

**Fiendish fractional exponents. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

$$25) \frac{x^{\frac{1}{2}} x^3}{x}$$

$$26) \frac{(x^2)^{\frac{3}{2}}}{x^{\frac{1}{2}} x^2}$$

$$27) \frac{\left(\frac{2}{b^3}\right)^3}{b \cdot b}$$

$$28) \frac{x^2 x^{\frac{3}{2}}}{(x^2)^{\frac{4}{3}}}$$

**Solve each equation. Convert both sides of the equation to the same base.**

$$29) 3^{2x-2} = 9$$

$$30) 6^{n-2} = 36$$

$$31) 216^{-2m} = 36$$

$$32) 4^{2b} = 4^{3-3b}$$

$$33) 16^{-2n} = \left(\frac{1}{64}\right)^{-3n-3}$$

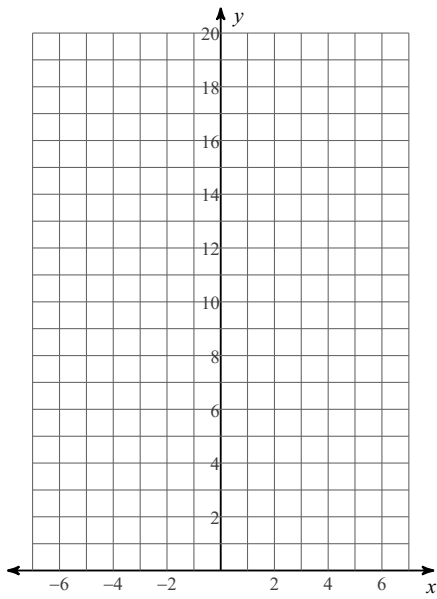
$$34) 25^x = 125$$

$$35) 2^{-3x} = 2^{3x}$$

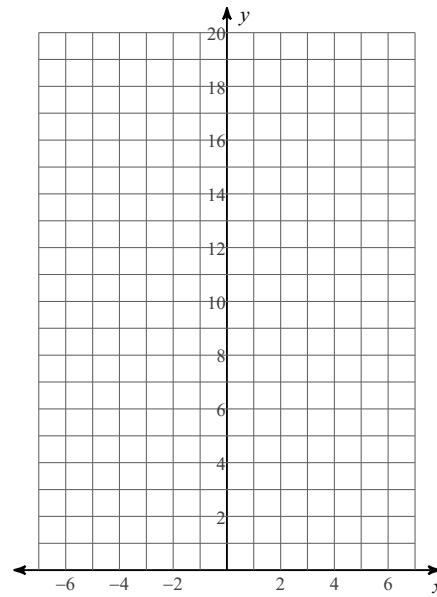
$$36) 6^{3-x} = 6^{3x-2}$$

Make a table with values of x (...-2, -1, 0, 1, 2, ...). Sketch the graph of each function.

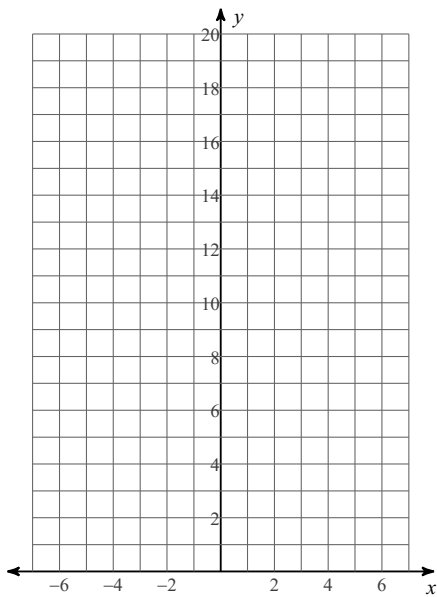
37)  $y = 4^x$



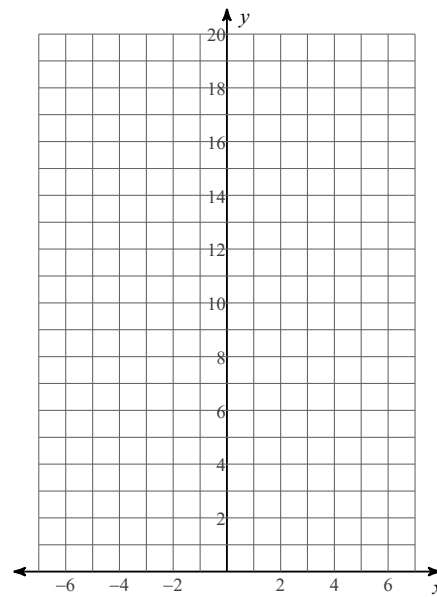
38)  $y = \left(\frac{1}{2}\right)^x$



39)  $y = \frac{1}{4} \cdot 4^x$



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



## Answers to Exponential Functions

1)  $3^5$

3)  $2^6$

5)  $2^9$

7) 1

9)  $\frac{1}{3^2}$

11) 2

13) 3

15)  $6k^2$

17)  $\frac{1}{x^9}$

19)  $\frac{1}{2m^3}$

21)  $\frac{2}{3v}$

23)  $3x^2$

25)  $x^{\frac{5}{2}}$

27) 1

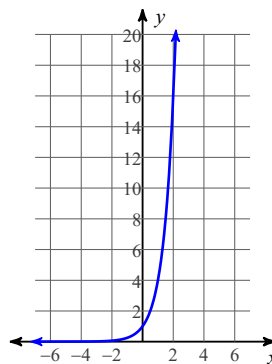
29)  $\{2\}$

31)  $\left\{-\frac{1}{3}\right\}$

33)  $\left\{-\frac{9}{13}\right\}$

35)  $\{0\}$

37)



39)

