

Power/ Exponential/ Indical Equations Worksheet

1. Solve each of the following equations:

- a) $2^{5x} = 1\ 024$
- b) $729^{s-5} = 3^{2(1-s)}$
- c) $(5^{2x})(25^{3x-2}) = 625$
- d) $49^{3x} = \frac{1}{343}$

2. Solve each of the following equations:

- a) $7^{3x} = 2\ 401$
- b) $243^{3-p} = 3^{p-3}$
- c) $(4^x)(8^{2x+1}) = 64$
- d) $25^{2x} = \frac{1}{125}$

3. Solve each of the following equations:

- a) $\frac{3^{2x-1}}{9} = 81$
- b) $6 \times 6^{3x} = 1$
- c) $4^{3x-1} = 64 \times 4^x$
- d) $4^{3x-1} = \sqrt{32} \times 8^x$

4. Solve each of the following equations:

- a) $\frac{4^{3x-1}}{16} = \frac{1}{64}$
- b) $7 \times 7^{3x-2} = 343 \times 7^{2x}$
- c) $5^{4x-3} = 125 \times 5^x$
- d) $\frac{1}{\sqrt{125^x}} = 25$

5. Solve each of the following equations:

- a) $\frac{5^{3x-4}}{25} = 625$
- b) $8 \times 8^{4x-3} = 512 \times 8^{2x}$
- c) $6^{3x-5} = 216 \times 6^{2x}$
- d) $343 = \sqrt[3]{7^x} \div 49^{1-x}$

6. Solve each of the following equations:

- a) $\frac{2^{4x-1}}{8} = \frac{1}{128}$
- b) $5 \times 5^{3x+1} = 125 \times 5^{x-2}$
- c) $7^{2x+3} = 343 \times 7^{x-1}$
- d) $1 = \sqrt{8} \times 16^x$

7. Solve each of the following equations:

- a) $\frac{2^{3x+2}}{16} = 64$
- b) $9 \times 9^{2x+3} = 27 \times 3^{x-2}$
- c) $5^{3x-2} = 625 \times 25^{x-3}$
- d) $9^{x+1} \div \sqrt[3]{27^{9x}} = 1$

8. Solve each of the following equations:

- a) $\frac{5^{4x-3}}{25} = \frac{1}{125}$
- b) $64 \times 8^{2x-1} = 512 \times 8^{x-3}$
- c) $9^{4x+5} = 729 \times 81^{x-2}$
- d) $36^{3x-1} = \sqrt{6^x} \times 216^x$

9. The number of fish in a pond *doubles* every month.

- a) If there is now 1 fish in the pond
- i) How many fish will there be:
 - (1) 1 month from now?
 - (2) 2 months from now?
 - (3) 3 months from now?
 - (4) x months from now?
 - ii) Using your answers from a) i)(4) calculate how many months it would take for the population of fish to be:
 - (1) 256
 - (2) 1024
- b) If there are 8 fish in the pond at the start.
- i) Repeat questions in a) i)
 - ii) Repeat questions in a) ii)

10. The number of ants in a nest *increases by 3 times its previous amount* each week.

- a) If there are now 1 ant in the nest
- i) How many ants will there be:
 - (1) 1 week from now?
 - (2) 2 weeks from now?
 - (3) 3 weeks from now?
 - (4) x weeks from now?
 - ii) Using your answers from a) i)(4) calculate how many weeks it would take for the population of ants to be:
 - (1) 243
 - (2) 6561
- b) If there are 27 ants in the nest at the start.
- i) Repeat questions in a) i)
 - ii) Repeat questions in a) ii)