Math worksheet on *'Exponents - Power Law - Exponent Base with Variable Power to Prime Base with Unknown Power (Level 1)'*. Part of a broader unit on *'Exponents - Multiplication and Division - Advanced'*

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**1** Solve for the missing exponent (?) in reduced form

$$(4^2)^n = 4^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{2n}{4}$ | $? = 3n$ | $? = \frac{4n}{1}$ | $? = 2n$ | $? = 6n$ | $? = n$ |

**2** Solve for the missing exponent (?) in reduced form

$$(2^2)^n = 2^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{3n}{2}$ | $? = \frac{2n}{6}$ | $? = 2n$ | $? = 3n$ | $? = \frac{3}{2n}$ | $? = \frac{2n}{1}$ |

**3** Solve for the missing exponent (?) in reduced form

$$(3^4)^n = 3^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{4n}{12}$ | $? = 7n$ | $? = \frac{3}{n}$ | $? = \frac{12n}{1}$ | $? = \frac{4}{12n}$ | $? = 4n$ |

**4** Solve for the missing exponent (?) in reduced form

$$(2^4)^n = 2^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{12n}{1}$ | $? = 3n$ | $? = \frac{3}{4n}$ | $? = 6n$ | $? = \frac{4}{12n}$ | $? = 4n$ |

**5** Solve for the missing exponent (?) in reduced form

$$(3^3)^n = 3^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{3}{6n}$ | $? = 3n$ | $? = \frac{6n}{1}$ | $? = \frac{2n}{3}$ | $? = n$ | $? = 6n$ |

**6** Solve for the missing exponent (?) in reduced form

$$(2^5)^n = 2^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = 2n$ | $? = \frac{2}{n}$ | $? = 7n$ | $? = n$ | $? = \frac{2n}{1}$ | $? = 5n$ |

**7** Solve for the missing exponent (?) in reduced form

$$(5^2)^n = 5^?$$

| a | b | c | d | e | f |
|---|---|---|---|---|---|
| $? = \frac{2n}{2}$ | $? = 7n$ | $? = \frac{5n}{1}$ | $? = 2n$ | $? = \frac{5}{n}$ | $? = \frac{4n}{1}$ |