



## Exponents - Fractional Bases and Exponents - Intro

- 1 Find the answer when this number is raised to its exponent

$$2^2$$

|         |        |        |
|---------|--------|--------|
| A<br>16 | B<br>2 | C<br>1 |
| D<br>7  | E<br>4 | F<br>8 |

- 2 Find the answer when this fraction is multiplied as shown

$$\left(\frac{1}{4}\right) \cdot \left(\frac{1}{4}\right)$$

|                    |                     |                      |
|--------------------|---------------------|----------------------|
| A<br>$\frac{3}{6}$ | B<br>$\frac{1}{16}$ | C<br>$\frac{2}{256}$ |
| D<br>$\frac{2}{4}$ | E<br>$\frac{1}{4}$  | F<br>2               |

- 3 Find the answer when this fraction is multiplied as shown

$$\left(\frac{1}{3}\right) \cdot \left(\frac{1}{3}\right) \cdot \left(\frac{1}{3}\right)$$

|                     |                     |                      |
|---------------------|---------------------|----------------------|
| A<br>$\frac{1}{9}$  | B<br>$\frac{3}{6}$  | C<br>$\frac{1}{243}$ |
| D<br>$\frac{3}{24}$ | E<br>$\frac{1}{27}$ | F<br>$\frac{4}{81}$  |

- 4 Find the answer when this fraction is multiplied as shown

$$\left(\frac{1}{2}\right) \cdot \left(\frac{1}{2}\right) \cdot \left(\frac{1}{2}\right) \cdot \left(\frac{1}{2}\right)$$

|                     |                     |                      |
|---------------------|---------------------|----------------------|
| A<br>$\frac{1}{32}$ | B<br>$\frac{5}{6}$  | C<br>$\frac{1}{6}$   |
| D<br>$\frac{1}{19}$ | E<br>$\frac{1}{16}$ | F<br>$-\frac{2}{32}$ |

- 5 Find the answer when this fraction is raised to its exponent

$$\left(\frac{1}{6}\right)^2$$

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| A<br>$\frac{1}{216}$ | B<br>$\frac{3}{33}$ | C<br>$\frac{1}{12}$ |
| D<br>$\frac{1}{36}$  | E<br>$\frac{1}{6}$  | F<br>$\frac{2}{12}$ |

- 6 Find the answer when this fraction is raised to its exponent

$$\left(\frac{1}{5}\right)^3$$

|                      |                     |                      |
|----------------------|---------------------|----------------------|
| A<br>$\frac{4}{15}$  | B<br>$\frac{1}{15}$ | C<br>$\frac{1}{122}$ |
| D<br>$\frac{1}{125}$ | E<br>$\frac{3}{5}$  | F<br>$\frac{3}{625}$ |

- 7 Find the answer when this fraction is raised to its exponent

$$\left(\frac{1}{3}\right)^3$$

|                     |                     |                       |
|---------------------|---------------------|-----------------------|
| A<br>$\frac{3}{3}$  | B<br>$\frac{1}{27}$ | C<br>$\frac{1}{243}$  |
| D<br>$\frac{4}{81}$ | E<br>$\frac{4}{3}$  | F<br>$-\frac{2}{243}$ |



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- 8** Find the answer when this fraction is multiplied as shown

$$\left(\frac{4}{6}\right) \cdot \left(\frac{4}{6}\right)$$

|                      |                    |                      |
|----------------------|--------------------|----------------------|
| A<br>$\frac{6}{6}$   | B<br>4             | C<br>$\frac{6}{12}$  |
| D<br>$\frac{16}{36}$ | E<br>$\frac{1}{8}$ | F<br>$\frac{19}{12}$ |

- 9** Find the answer when this fraction is multiplied as shown

$$\left(\frac{5}{8}\right) \cdot \left(\frac{5}{8}\right)$$

|                      |                        |                     |
|----------------------|------------------------|---------------------|
| A<br>$\frac{10}{61}$ | B<br>$\frac{125}{512}$ | C<br>$\frac{1}{61}$ |
| D<br>$\frac{25}{64}$ | E<br>$\frac{1}{512}$   | F<br>$\frac{28}{8}$ |

- 10** Find the answer when this fraction is multiplied as shown

$$\left(\frac{7}{9}\right) \cdot \left(\frac{7}{9}\right)$$

|                      |                       |                        |
|----------------------|-----------------------|------------------------|
| A<br>$\frac{46}{9}$  | B<br>$\frac{343}{18}$ | C<br>$\frac{9}{6,561}$ |
| D<br>$\frac{14}{78}$ | E<br>$\frac{7}{84}$   | F<br>$\frac{49}{81}$   |

- 11** Find the answer when this fraction is raised to its exponent

$$\left(\frac{3}{4}\right)^2$$

|                     |                      |                       |
|---------------------|----------------------|-----------------------|
| A<br>$\frac{9}{16}$ | B<br>$\frac{6}{64}$  | C<br>$\frac{27}{256}$ |
| D<br>$\frac{3}{8}$  | E<br>$\frac{12}{13}$ | F<br>$\frac{5}{64}$   |

- 12** Find the answer when this fraction is raised to its exponent

$$\left(\frac{7}{8}\right)^2$$

|                      |                         |
|----------------------|-------------------------|
| A<br>$\frac{49}{64}$ | B<br>$\frac{343}{16}$   |
| C<br>343             | D<br>$\frac{7}{67}$     |
| E<br>$\frac{7}{10}$  | F<br>$\frac{2,401}{61}$ |

- 13** Find the answer when this fraction is multiplied as shown

$$\left(\frac{-1}{6}\right) \cdot \left(\frac{-1}{6}\right)$$

|                     |                         |                      |
|---------------------|-------------------------|----------------------|
| A<br>$\frac{1}{8}$  | B<br>$\frac{1}{36}$     | C<br>$-\frac{1}{12}$ |
| D<br>$-\frac{1}{6}$ | E<br>$-\frac{1}{1,296}$ | F<br>$-\frac{2}{8}$  |

- 14** Find the answer when this fraction is multiplied as shown

$$\left(\frac{-1}{8}\right) \cdot \left(\frac{-1}{8}\right)$$

|                     |                      |                         |
|---------------------|----------------------|-------------------------|
| A<br>$-\frac{2}{8}$ | B<br>$-\frac{2}{61}$ | C<br>$-\frac{2}{4,096}$ |
| D<br>$\frac{1}{64}$ | E<br>$-\frac{1}{61}$ | F<br>$\frac{1}{67}$     |



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**15** Find the answer when this fraction is raised to its exponent

$$\left(\frac{-1}{5}\right)^2$$

A  $-\frac{1}{125}$

B  $\frac{1}{125}$

C  $\frac{1}{10}$

D 1

E  $\frac{1}{25}$

F  $-\frac{1}{625}$

**16** Given the hint, what is the fractional exponent the same as?

$$16^{\left(\frac{1}{2}\right)} \cdot 16^{\left(\frac{1}{2}\right)} = 16$$

$$16^{\left(\frac{1}{2}\right)} = ?$$

A  $2\sqrt{16}$

B 1

C  $4\sqrt{16}$

D  $\sqrt{16}$

E  $\sqrt{16}^2$

F  $\sqrt{4}$

**17** Find the answer when this fraction is multiplied as shown

$$\left(\frac{-2}{3}\right) \cdot \left(\frac{-2}{3}\right)$$

A 0

B  $-\frac{4}{27}$

C  $-\frac{2}{3}$

D  $-\frac{8}{6}$

E  $-\frac{4}{5}$

F  $\frac{4}{9}$

**18** Given the hint, what is the fractional exponent the same as?

$$9^{\left(\frac{1}{2}\right)} \cdot 9^{\left(\frac{1}{2}\right)} = 9$$

$$9^{\left(\frac{1}{2}\right)} = ?$$

A 3

B 4

C  $\frac{1}{9^2}$

D  $\frac{1}{9}$

E 2

F 9

**19** Find the answer when this fraction is raised to its exponent

$$\left(\frac{-1}{7}\right)^2$$

A  $\frac{1}{46}$

B  $-\frac{2}{9}$

C  $-\frac{1}{46}$

D  $\frac{1}{9}$

E  $-\frac{1}{2,401}$

F  $\frac{1}{49}$



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**20** Given the hint, what is the fractional exponent the same as?

$$16^{(\frac{1}{2})} \cdot 16^{(\frac{1}{2})} = 16$$

$$16^{(\frac{1}{2})} = ?$$

A

$$\sqrt{4}$$

B

$$2\sqrt{16}$$

C

$$4\sqrt{16}$$

D

$$\sqrt{16}$$

E

$$\sqrt{16}^2$$

F

$$\frac{1}{\sqrt{16}}$$

**21** Find the answer when this fraction is multiplied as shown

$$\left(\frac{-7}{5}\right) \cdot \left(\frac{-7}{5}\right)$$

A

$$-\frac{343}{625}$$

B

$$-\frac{343}{10}$$

C

$$-\frac{7}{5}$$

D

$$\frac{49}{25}$$

E

$$-\frac{5}{625}$$

F

$$-14$$

**22** Find the answer when this fraction is raised to its exponent

$$\left(\frac{-5}{2}\right)^2$$

A

$$\frac{28}{4}$$

B

$$-\frac{10}{8}$$

C

$$\frac{25}{4}$$

D

$$-10$$

E

$$\frac{625}{2}$$

F

$$-\frac{3}{4}$$

**23** Find the answer when this number is raised to its exponent

$$(-4)^2$$

A

$$-8$$

B

$$256$$

C

$$-64$$

D

$$19$$

E

$$16$$

F

$$-2$$

**24** Find the answer when this fraction is raised to its exponent

$$\left(\frac{-6}{7}\right)^2$$

A

$$-\frac{216}{14}$$

B

$$\frac{33}{343}$$

C

$$\frac{36}{49}$$

D

$$\frac{1,296}{46}$$

E

$$-\frac{12}{14}$$

F

$$-\frac{6}{343}$$



# Exponents - Fractional Bases and Exponents

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**25** Given the hint, what is the fractional exponent the same as?

$$125^{(\frac{1}{3})} \cdot 125^{(\frac{1}{3})} \cdot 125^{(\frac{1}{3})} = 125$$

$$125^{(\frac{1}{3})} = ?$$

|                      |              |
|----------------------|--------------|
| A<br>$\sqrt[4]{125}$ | B<br>4       |
| C<br>5               | D<br>6       |
| E<br>$\frac{1}{125}$ | F<br>$125^2$ |

**26** Factor the base number to make it easier to solve

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

|                                             |                                            |
|---------------------------------------------|--------------------------------------------|
| A<br>$(3 \cdot 3 \cdot 5)^{(\frac{1}{2})}$  | B<br>$(3 \cdot 3)^{(\frac{1}{2})}$         |
| C<br>$(3 \cdot 3 \cdot 13)^{(\frac{1}{2})}$ | D<br>$(3 \cdot 3 \cdot 3)^{(\frac{1}{2})}$ |
| E<br>$(3 \cdot 3 \cdot 11)^{(\frac{1}{2})}$ | F<br>$(3 \cdot 3 \cdot 7)^{(\frac{1}{2})}$ |

**27** Factor the base number to make it easier to solve

$$125^{(\frac{1}{3})}$$

|                                                     |                                                    |
|-----------------------------------------------------|----------------------------------------------------|
| A<br>$(2 \cdot 5 \cdot 5 \cdot 5)^{(\frac{1}{3})}$  | B<br>$(5 \cdot 5 \cdot 5 \cdot 5)^{(\frac{1}{3})}$ |
| C<br>$(5 \cdot 5 \cdot 5 \cdot 13)^{(\frac{1}{3})}$ | D<br>$(3 \cdot 5 \cdot 5 \cdot 5)^{(\frac{1}{3})}$ |
| E<br>$(5 \cdot 5 \cdot 5 \cdot 7)^{(\frac{1}{3})}$  | F<br>$(5 \cdot 5 \cdot 5)^{(\frac{1}{3})}$         |

**28** Find the answer when this factored number is raised to its exponent

$$(2 \cdot 2 \cdot 2 \cdot 2)^{(\frac{1}{2})}$$

|                  |        |        |
|------------------|--------|--------|
| A<br>1           | B<br>3 | C<br>2 |
| D<br>$4\sqrt{4}$ | E<br>5 | F<br>4 |

**29** Find the answer when this factored number is raised to its exponent

$$(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2)^{(\frac{1}{3})}$$

|        |                     |        |
|--------|---------------------|--------|
| A<br>2 | B<br>$4\sqrt[3]{4}$ | C<br>3 |
| D<br>5 | E<br>4              | F<br>1 |

**30** Find the radical that is the same as this number raised to its exponent

$$36^{(\frac{1}{2})}$$

|                            |                    |
|----------------------------|--------------------|
| A<br>$\sqrt{36}$           | B<br>$2\sqrt{36}$  |
| C<br>$\frac{1}{\sqrt{36}}$ | D<br>$\sqrt{36}^2$ |
| E<br>$4\sqrt{36}$          | F<br>$5\sqrt{36}$  |

**31** Find the radical that is the same as this number raised to its exponent

$$81^{(\frac{1}{4})}$$

|                       |                               |
|-----------------------|-------------------------------|
| A<br>$\sqrt[4]{81}$   | B<br>1                        |
| C<br>$\sqrt[4]{81}^4$ | D<br>$\frac{1}{\sqrt[4]{81}}$ |
| E<br>$2\sqrt[4]{81}$  |                               |



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**32** Find the answer when this number is raised to its exponent

$$4^{(\frac{1}{2})}$$

|             |   |   |
|-------------|---|---|
| A           | B | C |
| 3           | 2 | 5 |
| D           | E | F |
| $2\sqrt{4}$ | 1 | 4 |

**33** Find the answer when this number is raised to its exponent

$$27^{(\frac{1}{3})}$$

|                |   |                |
|----------------|---|----------------|
| A              | B | C              |
| $3\sqrt[3]{2}$ | 5 | $3\sqrt[3]{4}$ |
| D              | E | F              |
| 3              | 4 | 1              |

**34** Factor the base number to make it easier to solve

$$75^{(\frac{1}{2})}$$

|                                                |                                                |
|------------------------------------------------|------------------------------------------------|
| A                                              | B                                              |
| $(3 \cdot 5 \cdot 5 \cdot 13)^{(\frac{1}{2})}$ | $(3 \cdot 3 \cdot 5 \cdot 5)^{(\frac{1}{2})}$  |
| C                                              | D                                              |
| $(2 \cdot 3 \cdot 5 \cdot 5)^{(\frac{1}{2})}$  | $(3 \cdot 5 \cdot 5)^{(\frac{1}{2})}$          |
| E                                              | F                                              |
| $(3 \cdot 5 \cdot 5 \cdot 5)^{(\frac{1}{2})}$  | $(3 \cdot 5 \cdot 5 \cdot 11)^{(\frac{1}{2})}$ |

**35** Factor the base number to make it easier to solve

$$162^{(\frac{1}{4})}$$

|                                                               |                                                                |
|---------------------------------------------------------------|----------------------------------------------------------------|
| A                                                             | B                                                              |
| $(2 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 7)^{(\frac{1}{4})}$ | $(2 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 11)^{(\frac{1}{4})}$ |
| C                                                             | D                                                              |
| $(2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 3)^{(\frac{1}{4})}$ | $(2 \cdot 3 \cdot 3 \cdot 3)^{(\frac{1}{4})}$                  |
| E                                                             | F                                                              |
| $(2 \cdot 3 \cdot 3 \cdot 3 \cdot 3)^{(\frac{1}{4})}$         | $(2 \cdot 3 \cdot 3 \cdot 9)^{(\frac{1}{4})}$                  |

**36** Find the answer when this factored number is raised to its exponent

$$(2 \cdot 2 \cdot 3)^{(\frac{1}{2})}$$

|             |             |             |
|-------------|-------------|-------------|
| A           | B           | C           |
| $2\sqrt{2}$ | $3\sqrt{3}$ | 2           |
| D           | E           | F           |
| $2\sqrt{3}$ | $4\sqrt{3}$ | $5\sqrt{3}$ |

**37** Find the answer when this factored number is raised to its exponent

$$(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2)^{(\frac{1}{3})}$$

|                |                |               |
|----------------|----------------|---------------|
| A              | B              | C             |
| $3\sqrt[3]{4}$ | $2\sqrt[3]{2}$ | $\sqrt[3]{4}$ |
| D              | E              |               |
| 2              | $2\sqrt[3]{4}$ |               |

**38** Find the radical that is the same as this number raised to its exponent

$$45^{(\frac{1}{2})}$$

|                       |              |
|-----------------------|--------------|
| A                     | B            |
| $\frac{1}{\sqrt{45}}$ | $3\sqrt{45}$ |
| C                     | D            |
| $4\sqrt{45}$          | 1            |
| E                     | F            |
| $\sqrt{45}$           | $5\sqrt{45}$ |

**39** Find the radical that is the same as this number raised to its exponent

$$50^{(\frac{1}{2})}$$

|               |                       |
|---------------|-----------------------|
| A             | B                     |
| 1             | $\frac{1}{\sqrt{50}}$ |
| C             | D                     |
| $\sqrt{50}$   | $3\sqrt{50}$          |
| E             | F                     |
| $\sqrt{50}^2$ | $4\sqrt{50}$          |



## Exponents - Fractional Bases and Exponents - Intro

- 40** Factor this exponent's base number and express it as a radical

$$108^{\left(\frac{1}{2}\right)}$$

A  $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 11}$

B  $\sqrt{2 \cdot 3 \cdot 3 \cdot 3}$

C  $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 13}$

D  $\sqrt{2 \cdot 2 \cdot 3 \cdot 3}$

E  $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 5}$

F  $\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}$

- 41** Factor this exponent's base number and express it as a radical

$$108^{\left(\frac{1}{3}\right)}$$

A  $\sqrt[3]{2 \cdot 2 \cdot 3 \cdot 3}$

B  $\sqrt[3]{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 5}$

C  $\sqrt[3]{2 \cdot 6 \cdot 3 \cdot 3}$

D  $\sqrt[3]{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 3}$

E  $\sqrt[3]{2 \cdot 2 \cdot 3 \cdot 9}$

F  $\sqrt[3]{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}$

- 42** Find the answer when this number is raised to its exponent

$$32^{\left(\frac{1}{2}\right)}$$

A  $\sqrt{2}$

B  $2\sqrt{2}$

C  $4\sqrt{2}$

D 4

E  $5\sqrt{2}$

F  $4\sqrt{4}$

- 43** Find the answer when this number is raised to its exponent

$$24^{\left(\frac{1}{2}\right)}$$

A  $2\sqrt{3}$

B  $\sqrt{6}$

C  $5\sqrt{6}$

D 2

E  $2\sqrt{6}$

F  $3\sqrt{6}$