

## Exponents - Fractional Bases and Exponents - Practice

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

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

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

|                            |                              |                             |
|----------------------------|------------------------------|-----------------------------|
| A<br>$\frac{1}{\sqrt{4}}$  | B<br>$\frac{1}{\sqrt{16}^2}$ | C<br>$\frac{1}{5\sqrt{16}}$ |
| D<br>$\frac{1}{\sqrt{16}}$ | E<br>$\sqrt{16}^2$           | F<br>$\frac{1}{1}$          |

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

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

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

|                           |                             |                            |
|---------------------------|-----------------------------|----------------------------|
| A<br>$\frac{1}{\sqrt{9}}$ | B<br>$\sqrt{9}^2$           | C<br>$\frac{1}{4\sqrt{9}}$ |
| D<br>$\frac{1}{\sqrt{2}}$ | E<br>$\frac{1}{\sqrt{9}^2}$ | F<br>$\frac{1}{\sqrt{4}}$  |

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

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

$$4^{(-\frac{1}{2})} = ?$$

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

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

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

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

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

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

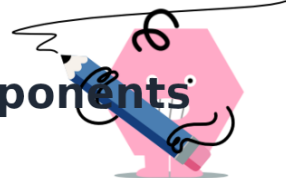
$$(5 \cdot 5)^{(-\frac{1}{2})}$$

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

- 6** Factor the base number and simplify to make it easier to solve

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

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



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- 7** Factor the base number and simplify to make it easier to solve

$$32^{\left(\frac{-1}{5}\right)}$$

|                                                                                         |                                                                                          |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| A<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 2)^{\left(\frac{1}{5}\right)}}$                 | B<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 4)^{\left(\frac{1}{5}\right)}}$                  |
| C<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3)^{\left(\frac{1}{5}\right)}}$ | D<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2)^{\left(\frac{1}{5}\right)}}$  |
| E<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2)^{\left(\frac{1}{5}\right)}}$         | F<br>$\frac{1}{(2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 11)^{\left(\frac{1}{5}\right)}}$ |

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

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

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

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

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

|                            |                           |                            |
|----------------------------|---------------------------|----------------------------|
| A<br>$\frac{1}{4\sqrt{9}}$ | B<br>$\sqrt{9}$           | C<br>$\frac{1}{1}$         |
| D<br>$\frac{1}{3\sqrt{9}}$ | E<br>$\frac{1}{\sqrt{9}}$ | F<br>$\frac{1}{5\sqrt{9}}$ |

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

$$27^{\left(\frac{-1}{3}\right)}$$

|                                |                               |                                 |
|--------------------------------|-------------------------------|---------------------------------|
| A<br>$\frac{1}{5\sqrt[3]{27}}$ | B<br>$\frac{1}{1}$            | C<br>$\frac{1}{\sqrt[3]{27^2}}$ |
| D<br>$\sqrt[3]{27^3}$          | E<br>$\frac{1}{\sqrt[3]{27}}$ | F<br>$\frac{1}{\sqrt[3]{3}}$    |

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

$$25^{\left(\frac{-1}{2}\right)}$$

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

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

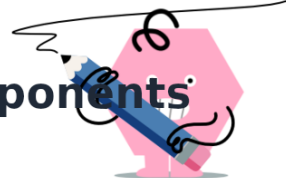
$$16^{\left(\frac{-1}{4}\right)}$$

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

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

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

|                    |                             |                     |
|--------------------|-----------------------------|---------------------|
| A<br>$\frac{1}{5}$ | B<br>$\frac{1}{4}$          | C<br>$\frac{1}{1}$  |
| D<br>$\frac{1}{3}$ | E<br>$\frac{1}{12\sqrt{3}}$ | F<br>$\frac{1}{12}$ |



## Exponents - Fractional Bases and Exponents - Practice

- 14** Factor the base number and simplify to make it easier to solve

$$50^{\left(\frac{-1}{2}\right)}$$

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

- 15** Factor the base number and simplify to make it easier to solve

$$50^{\left(\frac{-1}{2}\right)}$$

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

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

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

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

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

$$48^{\left(\frac{-1}{2}\right)}$$

|                             |                              |                             |
|-----------------------------|------------------------------|-----------------------------|
| A<br>$\frac{1}{\sqrt{48}}$  | B<br>$\frac{1}{\sqrt{48}^2}$ | C<br>$\sqrt{48}$            |
| D<br>$\frac{1}{4\sqrt{48}}$ | E<br>$\sqrt{48}^2$           | F<br>$\frac{1}{5\sqrt{48}}$ |

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

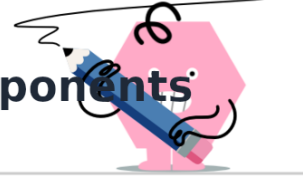
$$12^{\left(\frac{-1}{2}\right)}$$

|                            |                             |                              |
|----------------------------|-----------------------------|------------------------------|
| A<br>$\frac{1}{1}$         | B<br>$\sqrt{12}$            | C<br>$\frac{1}{\sqrt{12}^2}$ |
| D<br>$\frac{1}{\sqrt{12}}$ | E<br>$\frac{1}{4\sqrt{12}}$ | F<br>$\frac{1}{3\sqrt{12}}$  |

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

$$20^{\left(\frac{-1}{2}\right)}$$

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



## Exponents - Fractional Bases and Exponents - Practice

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

$$54^{\left(\frac{-1}{2}\right)}$$

|                                                           |                                                           |
|-----------------------------------------------------------|-----------------------------------------------------------|
| A<br>$\frac{1}{\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}}$ | B<br>$\frac{1}{\sqrt{2 \cdot 3 \cdot 3 \cdot 3 \cdot 7}}$ |
| C<br>$\frac{1}{\sqrt{3 \cdot 3 \cdot 3}}$                 | D<br>$\frac{1}{\sqrt{2 \cdot 3 \cdot 9}}$                 |
| E<br>$\frac{1}{\sqrt{2 \cdot 3 \cdot 3}}$                 | F<br>$\frac{1}{\sqrt{2 \cdot 3 \cdot 3 \cdot 3}}$         |

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

$$50^{\left(\frac{-1}{2}\right)}$$

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

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

$$150^{\left(\frac{-1}{2}\right)}$$

|                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| A<br>$\frac{1}{5\sqrt{3}}$ | B<br>$\frac{1}{2\sqrt{6}}$ | C<br>$\frac{1}{\sqrt{6}}$  |
| D<br>$\frac{1}{5}$         | E<br>$\frac{1}{3\sqrt{6}}$ | F<br>$\frac{1}{5\sqrt{6}}$ |

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

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

|                     |                      |                     |
|---------------------|----------------------|---------------------|
| A<br>$-\frac{1}{8}$ | B<br>$-\frac{1}{11}$ | C<br>$-\frac{4}{6}$ |
| D<br>$-\frac{1}{4}$ | E<br>$\frac{2}{6}$   | F<br>$\frac{1}{16}$ |

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

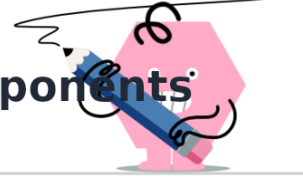
$$\left(\frac{1}{121}\right)^{\left(\frac{1}{2}\right)}$$

|                    |                            |                     |
|--------------------|----------------------------|---------------------|
| A<br>$\frac{1}{2}$ | B<br>$\frac{\sqrt{3}}{11}$ | C<br>$\frac{1}{11}$ |
| D<br>$3$           | E<br>$1$                   | F<br>$\frac{4}{11}$ |

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

$$\left(\frac{-1}{11}\right) \cdot \left(\frac{-1}{11}\right)$$

|                         |                       |                      |
|-------------------------|-----------------------|----------------------|
| A<br>$-\frac{1}{1,331}$ | B<br>$-\frac{1}{13}$  | C<br>$-\frac{2}{11}$ |
| D<br>$-2$               | E<br>$-\frac{2}{124}$ | F<br>$\frac{1}{121}$ |



## Exponents - Fractional Bases and Exponents - Practice

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

$$\left(\frac{1}{49}\right)^{\left(\frac{1}{2}\right)}$$

|                 |              |                 |
|-----------------|--------------|-----------------|
| A $\frac{4}{7}$ | B $\sqrt{4}$ | C $\frac{1}{7}$ |
| D 4             | E 1          | F $\frac{1}{4}$ |

**27** 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 $\frac{49}{25}$    | D $-\frac{7}{5}$    |
| E $-\frac{5}{625}$   | F -14               |

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

$$\left(\frac{9}{121}\right)^{\left(\frac{1}{2}\right)}$$

|                 |                  |                  |
|-----------------|------------------|------------------|
| A $\frac{1}{2}$ | B $\frac{5}{11}$ | C $\frac{1}{5}$  |
| D $\frac{3}{4}$ | E $\frac{3}{5}$  | F $\frac{3}{11}$ |

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

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

|                  |                     |                    |
|------------------|---------------------|--------------------|
| A $\frac{36}{6}$ | B $\frac{1,296}{4}$ | C $-\frac{213}{5}$ |
| D $\frac{36}{2}$ | E $-\frac{216}{8}$  | F $-\frac{219}{4}$ |

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

$$\left(\frac{49}{9}\right)^{\left(\frac{1}{2}\right)}$$

|                 |                 |                 |
|-----------------|-----------------|-----------------|
| A $\frac{7}{3}$ | B 1             | C $\frac{1}{3}$ |
| D $\frac{7}{4}$ | E $\frac{2}{3}$ | F 7             |

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

$$(-7)^2$$

|         |      |       |
|---------|------|-------|
| A 2,401 | B 46 | C -14 |
| D 49    | E 1  | F -7  |

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

$$12^{\left(\frac{1}{2}\right)}$$

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



## Exponents - Fractional Bases and Exponents - Practice

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

$$\left(\frac{-1}{4}\right)^3$$

|                      |                        |                     |
|----------------------|------------------------|---------------------|
| A<br>$-\frac{1}{64}$ | B<br>$-\frac{4}{256}$  | C<br>$-\frac{3}{7}$ |
| D<br>$\frac{2}{7}$   | E<br>$\frac{2}{1,024}$ | F<br>$\frac{1}{7}$  |

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

$$\left(\frac{-1}{11}\right)^2$$

|                      |                        |                      |
|----------------------|------------------------|----------------------|
| A<br>$-\frac{1}{22}$ | B<br>$\frac{1}{1,331}$ | C<br>$-1$            |
| D<br>$\frac{4}{22}$  | E<br>$-\frac{1}{13}$   | F<br>$\frac{1}{121}$ |

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

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

|                      |                       |                      |
|----------------------|-----------------------|----------------------|
| A<br>$\frac{16}{9}$  | B<br>$-\frac{6}{9}$   | C<br>$\frac{1}{24}$  |
| D<br>$-\frac{32}{6}$ | E<br>$-\frac{6}{243}$ | F<br>$-\frac{8}{27}$ |

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

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

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

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

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

|                    |                            |
|--------------------|----------------------------|
| A<br>$\sqrt{45}^2$ | B<br>$5\sqrt{45}$          |
| C<br>1             | D<br>$4\sqrt{45}$          |
| E<br>$\sqrt{45}$   | F<br>$\frac{1}{\sqrt{45}}$ |