

The year(s) in perspective: 2016 -> 2017

1. How many days were there in 2016?

366 (leap year)

2. Is 2017 a prime number?

Yes!! Previous 2011, next 2027 (2021 = $43 \cdot 47$)

3. How many days will there be in 2017?

365

2017 New year

Unit 7
Radical expressions

What is the value of :

$$\frac{2^{2018} + 2^{2016}}{2^{2018} - 2^{2016}}$$

- (A) -1 (B) 1 (C) $\frac{5}{3}$ (D) 2016 (E) 2^{4032}

Warm-up: Need to know !

Unit 7
Radical expressions

- | | |
|---------------------------------------|---------------------------------|
| 1. $y^7 \cdot y^2 = ?$ | 7. $(4^2)^4 = 4^?$ |
| 2. $8^3 \cdot 8^{-2} = ?$ | 8. $(a^{-3})^{-4} = ?$ |
| 3. $(3x^2y^{-4}) \cdot (4x^3y^2) = ?$ | 9. $(4xy^{-3})^3 = ?$ |
| 4. $\frac{4^8}{4^2} = ?$ | 10. $(10x^3y^{-2}z^{-4})^2 = ?$ |
| 5. $\frac{3^{-4}}{3^{-6}} = ?$ | 11. $ -8 = ?$ |
| 6. $\frac{32x^3y^{10}}{4x^4y^4} = ?$ | 12. True or False: |
| | a. $ 3x = 3 x $ |
| | b. $ a + b = a + b $ |

2017 New year

Unit 7
Radical expressions

Which of the following is the same as the ratio

$$\frac{2^{2016} \cdot 3^{2018}}{6^{2017}}$$

- (A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) $\frac{3}{2}$

Drill warm up

1. $(\sqrt{x+3})^2 =$

2. $\sqrt{(x+3)^2} =$

3. $\sqrt[3]{(y-2)^3} =$

4. $\sqrt{x^2} =$

Two simple

Unit 7
Radical expressions

1. $2 = \sqrt{8} \div ?$

- (A) 4 (B)
- $\sqrt{6}$
- (C)
- $\sqrt{4}$
- (D)
- $\sqrt{2}$

2. $|x| + |-x| =$

- (A) 0 (B)
- $|x|$
- (C)
- $-x$
- (D)
- $2 \cdot |x|$

Two simple

Unit 7
Radical expressions

1. $x^{18} + 2x^{17} + x^{16} = (?) \cdot (x+1)^2$

- (A)
- x^4
- (B)
- x^8
- (C)
- x^{12}
- (D)
- x^{16}

2. If $\sqrt{M \cdot A \cdot T \cdot H} = M \cdot A \cdot T$, then the value of H must be:

- (A)
- $M \cdot A \cdot T$
- (B)
- $\sqrt{M \cdot A \cdot T}$
- (C)
- $M^2 \cdot A^2 \cdot T^2$
- (D) 1

Radicals

Unit 7
Radical expressions

Simplify

$$\sqrt{\frac{2^{x+4} - 2(2^{x+1})}{2(2^{x+3})}}$$

- (A)
- $\frac{3}{8}$
- (B)
- $\frac{\sqrt{3}}{4}$
- (C)
- 2^x
- (D)
- $\frac{2\sqrt{3}}{4}$
- (E)
- $\frac{\sqrt{3}}{2}$

Drill warm up

1. Simplify: $\frac{2}{5}\sqrt{45} + \frac{3}{2}\sqrt{15} + \frac{1}{4}\sqrt{75} =$

2. $\frac{12\sqrt{68x^3y^3}}{\sqrt{4x^2y^2}} - \frac{9\sqrt{85x^3y^3}}{\sqrt{5x^2y^2}} =$

- A.
- $3\sqrt{17x^3y}$
- B.
- $6\sqrt{68x^3y} - 9\sqrt{17x^3y}$
- C.
- $21x\sqrt{17y}$
- D.
- $3|x|\sqrt{17xy}$

Radicals

Unit 7
Radical expressions

AMC10

Assume $x < 0$. Which of the following is equivalent to

$$\sqrt[4]{\frac{x^3}{1 - \frac{x-1}{x}}}$$
 ?

- (a)
- $-x$
- (b)
- x
- (c)
- 1
- (d)
- $\sqrt[4]{\frac{x}{x}}$
- (e)
- $x\sqrt{-1}$

Warm-up (timed!)

1. Simplify: $\sqrt{32}$

2. Simplify: $\sqrt{20x^6y^2z^3}$

3. Simplify: $5\sqrt{3} \cdot (3\sqrt{6} - \sqrt{3})$

4. Simplify: $4\sqrt{3} + 2\sqrt{12} - 2\sqrt{48} + 3\sqrt{75}$

5. Rationalize denominator: $\frac{2}{3-2\sqrt{5}}$

6. Rationalize denominator: $\frac{3-\sqrt{5}}{2+\sqrt{5}}$

Radicals

Unit 7
Radical expressions

AMC10

Simplify (N is a positive integer greater than 1)

$$\sqrt[3]{\sqrt[3]{N^3 \sqrt[3]{N^3 \sqrt[3]{N}}}}$$

- (A)
- \sqrt{N}
- (B)
- $N^{\frac{13}{24}}$
- (C)
- $N^{\frac{23}{24}}$
- (D)
- $N^{\frac{13}{8}}$
- (E)
- $N^{\frac{8}{9}}$

Radicals

Unit 7
Radical expressions

AMC10

Simplify (x is a positive integer greater than 1)

$$\sqrt[x]{\sqrt{\sqrt[3]{25}}}$$

- (A) 25^{3x} (B) $25^{\frac{1}{3x}}$ (C) $5^{\frac{1}{3x}}$ (D) 5^{3x} (E) none of these

Radicals

Unit 7
Radical expressions

$$\sqrt{2\sqrt{2\sqrt{2\sqrt{\dots}}}} = ?$$

Radicals

Unit 7
Radical expressions

Explain:

$$\begin{aligned} 1 &= \sqrt{-1} = \\ &\sqrt{(-1) \cdot (-1)} = \\ &\sqrt{-1} \cdot \sqrt{-1} = \\ i \cdot i &= \\ &-1 \end{aligned}$$

Word problems

Unit 6
Rational expressions

Sally can type one page in 10 minutes.
Tim can type one page in 15 minutes.

How long will it take them together to type 100 pages?

Solving rational expression

It takes 2 hours to drive between the towns of San-Jose and San-Francisco.

It takes 8 hours to make the same trip by bicycle.

How long will it take for a bicycle and car to meet, starting at opposite towns at the same time?