Your grade: 100%

Your latest: **100%** • Your highest: **100%** • To pass you need at least 75%. We keep your highest score.

Next item →

1. **Re write the number $784 = 2 \times 2 \times 2 \times 2 \times 7 \times 7$ using exponents.** 1 / 1 point

- (•) $(2^4)(7^2)$
- ( ) $(2 \times 7)^6$
- ( ) $(2^6)(7^6)$
- ( ) $(16^4)(49^2)$

Correct
For this type of problem, count the number of times each relevant factor appears in the product. That number is the exponent for that factor.

2. **What is $(x^2 - 5)^0$?** 1 / 1 point

- ( ) (x^2)
- (•) 1
- ( ) $(x^2) - 5$
- ( ) -4

Correct
Any real number (except zero) raised to the"zeroith" power $= 1$.

3. **Simplify $((x-5)^2)^{-3}$** 1 / 1 point

- ( ) $(x-5)^{-1}$
- ( ) $(x-5)$
- ( ) $(x-5)^{-5}$
- (•) $(x-5)^{-6}$

Correct
By Rule 2, "Power to a Power," multiply the exponents and get:

$$(x-5)^{(2\times -3)} = (x-5)^{-6}$$

By the definition of negative exponents, this is equal to $\dfrac{1}{(x-5)^6}$

4. **Simplify** $(\dfrac{8^2}{8^7})^2$ 1 / 1 point

- ( ) 8^{-5}
- ( ) 8^{-4}
- (•) 8^{-10}
- ( ) 8^{-1}

Correct
We can first simplify what is inside the parenthesis to 8^{-5} using the Division and Negative Powers Rule.

Then apply division and negative powers-- the result is the same. $\dfrac{8^4}{8^{14}} = 8^{-10}$

5. $\log 35 = \log 7 + \log x$ 1 / 1 point

Solve for x

- ( ) 4
- ( ) 7
- (•) 5
- ( ) 28

Correct
$\log(x) = \log 35 - \log 7$

$\log(x) = \log(\dfrac{35}{7})$

By the Quotient Rule $\log x = \log 5$

6. $\log_2(x^2 + 5x + 7) = 0$ 1 / 1 point

Solve for x

- ( ) $x = 3$

- ○ $x = 2$ or $x = 3$
- ○ $x = 2$
- ◉ $x = -2$ **or** $x = -3$

Correct

We use the property that $b^{\log_b a} = a$

Use both sides as exponent for 2.

$2^{\log_2 x^2+5x+7} = 2^0$

$x^2 + 5x + 7 = 1$

$x^2 + 5x + 6 = 0$

$(x + 3)(x + 2) = 0$

$x = -3$ **OR**

$x = -2$

7. **Simplify** $\log_2 72 - \log_2 9$ 1 / 1 point

- ○ $\log_2 4$
- ○ $\log_2 63$
- ○ 4
- ◉ 3

Correct

By the quotient rule, this is $\log_2 \frac{72}{9} = \log_2 2^3 = 3$

8. **Simplify** $\log_3 9 - \log_3 3 + \log_3 5$ 1 / 1 point

- ◉ $\log_3 15$
- ○ 15
- ○ $\log_3 8$
- ○ 8

Correct

By the Quotient and Product Rules, this is $\log_3 \frac{9 \times 5}{3} = \log_3 15$

9. **Simplify** $\log_2(3^8 \times 5^7)$ 1 / 1 point

- ○ $15 \times \log_2 56$
- ◉ $(8 \times \log_2 3) + (7 \times \log_2 5)$
- ○ $(5 \times \log_2 3) + (8 \times \log_2 5)$
- ○ $56 \times \log_2 15$

Correct

We first apply the Product Rule to convert to the sum: $\log_2(3^8) + \log_2(5^7)$**. Then apply the power and root rule.**

10. **If** $\log_{10} y = 100$**, what is** $\log_2 y =?$ 1 / 1 point

- ○ 301.03
- ○ 500
- ○ 20
- ◉ 332.19

Correct

Use the change of base formula, $\log_a b = \frac{\log_x b}{\log_x a}$

Where the "old" base is x **and the "new" base is** a**.**

So $\frac{100}{\log_{10}(2)} = \frac{100}{0.30103} = 332.19$

11. **A tree is growing taller at a continuous rate. In the past 12 years it has grown from 3 meters to 15 meters. What is its rate of growth per year?** 1 / 1 point

- ○ 10.41%
- ○ 11.41%
- ○ 12.41%
- ◉ 13.41%

Correct

$\frac{\ln \frac{15}{3}}{} = 0.1341$

12

12. **Bacteria can reproduce exponentially if not constrained. Assume a colony grows at a continually compounded rate of 400% per day. How many days before a colony with initial mass of 6.25×10^{-10} grams weights 1000 Kilograms?** 1 / 1 point

- (●) 8.75 **days**
- ( ) 875 **days**
- ( ) 87.5 **days**
- ( ) 0.875 **days**

Correct

$$6.25 \times 10^{-10} \times e^{4t} = 10^6$$

$$4t = \ln\left(\frac{10^6}{(6.25 \times 10^{-10})}\right) = 35.00878$$

$$t = \ln \frac{10^6}{6.25 \times 10^{-10}} = 8.752195$$