

ANSWER PRESENTATION TOOL

Algebra 2 - Student Edit

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Practice Tes

1-16

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1. Inequality: $5\sqrt{x-3} - 2 \leq 13$

$$5\sqrt{x-3} \leq 15$$

$$\sqrt{x-3} \leq 3$$

$$x-3 \leq 9$$

$$x \leq 12$$

Consider the radicand.

$$x-3 \geq 0$$

$$x \geq 3$$

So, the solution is $3 \leq x \leq 12$.

Equation: $5\sqrt{x-3} - 2 = 13$

$$5\sqrt{x-3} = 15$$

$$\sqrt{x-3} = 3$$

$$x-3 = 9$$

$$x = 12$$

The steps used to solve a radical inequality and to solve a radical equation are the same, but when solving the inequality, you must check the domain for values that make the radicand negative.

2. The graph of g is a translation 3 units right of the graph of f .

$$\begin{aligned} g(x) &= f(x-3) \\ &= \sqrt{x-3} \end{aligned}$$

3. The graph of g is a vertical stretch by a factor of 2 followed by a reflection in the x -axis of the graph of f .

$$\begin{aligned} g(x) &= -2f(x) \\ &= -2\sqrt[3]{x} \end{aligned}$$

4. The graph of g is a vertical stretch by a factor of 2 followed by a translation 2 units up the graph of f .

$$\begin{aligned} g(x) &= 2f(x) + 2 \\ &= 2\sqrt[5]{x} + 2 \end{aligned}$$

5. $64^{2/3} = (64^{1/3})^2 = 4^2 = 16$

The cube root of 64 is 4 and 4^2 is 16.

6. $(-27)^{5/3} = [(-27)^{1/3}]^5 = (-3)^5 = -243$

The cube root of -27 is -3 and $(-3)^5$ is -243 .

7. $\sqrt[4]{48xy^{11}z^3} = 2y^2\sqrt[4]{3xy^3z^3}$

The fourth root of 16 and y^8 can be simplified.

8. $\frac{\sqrt[3]{256}}{\sqrt[3]{32}} = \sqrt[3]{\frac{256}{32}} = \sqrt[3]{8} = 2$

The radical expression can be simplified to $\sqrt[3]{8}$ and the cube root of 8 is 2.

$$\begin{aligned}
 9. f(h(x)) &= f(4x + 12) \\
 &= \frac{1}{4}(4x + 12) + 6 \\
 &= x + 3 + 6 \\
 &= x + 9
 \end{aligned}$$

The domain is all real numbers.

$$\begin{aligned}
 10. h(g(x)) &= h(3x^{-1}) \\
 &= 4(3x^{-1}) + 12 \\
 &= \frac{12}{x} + 12
 \end{aligned}$$

The domain is all real numbers except $x = 0$.

$$\begin{aligned}
 11. g(f(x)) &= g\left(\frac{1}{4}x + 6\right) \\
 &= 3\left(\frac{1}{4}x + 6\right)^{-1} \\
 &= \frac{3}{\frac{1}{4}x + 6} \\
 &= \frac{12}{x + 24}
 \end{aligned}$$

All domain is all real numbers except $x = -24$.

$$\begin{aligned}
 12. f(f(x)) &= f\left(\frac{1}{4}x + 6\right) \\
 &= \frac{1}{4}\left(\frac{1}{4}x + 6\right) + 6 \\
 &= \frac{1}{16}x + \frac{3}{2} + 6 \\
 &= \frac{1}{16}x + \frac{15}{2}
 \end{aligned}$$

The domain is all real numbers.

13. Since the x -value of the function is the y -value of the inverse of the function and the y -value of the function is the x -value of the inverse of the function, x and y are exchanged. So, the graph of f^{-1} has focus $(-7, -2)$ and directrix $x = -1$.

14. Rabbit: $R = 73.3(2.5)^{3/4}$
 ≈ 145.7 Kcal/day

Sheep: $R = 73.3(50)^{3/4}$
 ≈ 1378.3 Kcal/day

Human: $R = 73.3(70)^{3/4}$
 ≈ 1773.9 Kcal/day

Lion: $R = 73.3(210)^{3/4}$
 ≈ 4043.6 Kcal/day

15. $(f + g)(x) = f(x) + g(x) = 6x^{3/5} - x^{3/5} = 5x^{3/5}$

The functions f and g each have the same domain: all real numbers. So, the domain of $f + g$ is all real numbers.

When $x = 32$, the value of the sum is

$$(f + g)(32) = 5(32)^{3/5} = 5(8) = 40.$$

$$(f - g)(x) = f(x) - g(x) = 6x^{3/5} + x^{3/5} = 7x^{3/5}$$

The functions f and g each have the same domain: all real numbers. So, the domain of $f - g$ is all real numbers.

When $x = 32$, the value of the difference is

$$(f - g)(32) = 7(32)^{3/5} = 7(8) = 56.$$

$$16. (fg)(x) = f(x)g(x) = \left(\frac{1}{2}x^{3/4}\right)(8x) = 4x^{7/4}$$

The domain of f is $x \geq 0$ and the domain of g is all real numbers. So, the domain of fg is $x \geq 0$. When $x = 16$, the value of the product is

$$(fg)(16) = 4(16)^{7/4} = 4(128) = 512.$$

$$\left(\frac{f}{g}\right)(x) = \frac{\frac{1}{2}x^{3/4}}{8x} = \frac{1}{16x^{1/4}}$$

The domain of f is $x \geq 0$ and the domain of g is all real numbers. So, the domain of $\frac{f}{g}$ consists of $x > 0$. When $x = 16$, the value of the quotient is

$$\left(\frac{f}{g}\right)(16) = \frac{1}{16(16)^{1/4}} = \frac{1}{16(2)} = \frac{1}{32}.$$

