

Topics:

6.1 → properties of exponents

↳ $\sqrt[n]{a}$; $a^m \cdot a^n = a^{m+n}$

6.2 → rational exp.

↳ $a^{\frac{m}{n}} = \sqrt[n]{a^m}$ or $(\sqrt[n]{a})^m$

↳ Addition (i.e., $4\sqrt{2} - 8\sqrt{18}$)

6.3 → Func. Ops & comp

↳ $f(x)+g(x)$ or $\frac{f(x)}{g(x)}$ & $f(g(x))$ or $f(f(x))$

↳ Domain (ie ÷ by 0 or $\sqrt{-}$) \mathbb{R}

6.4 → Inverse Func.

↳ flip x and y

↳ verify inverses (composition!) Show work!

6.5 → Graphs

↳ \sqrt{x} & $\sqrt[3]{x}$

↳ a, h, k

→ Domain/Range

6.6 → solve equations

↳ x by itself

↳ check solutions!!!

Evaluate the expression without using a calculator.

8. $81^{1/4}$

$$\sqrt[4]{81}$$
$$= 3$$

9. $0^{1/3}$

$$0$$

10. $\sqrt[3]{-64}$

$$-4$$

14. $(\sqrt[3]{8})^7$

$$2^7 = 256$$

12. $256^{3/4}$

$$\sqrt[4]{256^3}$$
$$= 4^3 = 64$$

13. $27^{-2/3}$

$$\frac{1}{27^{2/3}}$$
$$\frac{1}{\sqrt[3]{27}^2} = \frac{1}{9}$$

Write the expression in simplest form. Assume all variables are positive.

16. $\sqrt[3]{80}$

$2^3 \sqrt{10}$

17. $(3^4 \cdot 5^4)^{-1/4}$

$(15^4)^{-1/4}$
 $(15)^{-1} = \frac{1}{15}$

$\frac{4 \cdot -\frac{1}{4}}{1} = -\frac{4}{4} = -1$

Let $f(x) = 4x - 6$ and $g(x) = x + 8$. Perform the indicated operation.

20. $f(x) + g(x)$

$$4x - 6 + x + 8$$
$$5x + 2$$

21. $f(x) - g(x)$

$$4x - 6 - (x + 8)$$
$$4x - 6 - x - 8$$
$$3x - 14$$

22. $f(x) \cdot g(x)$

$$(4x - 6)(x + 8)$$
$$4x^2 + 32x - 6x - 48$$
$$4x^2 + 26x - 48$$

23. $f(g(x))$

$$4(x + 8) - 6$$
$$4x + 32 - 6$$
$$4x + 26$$

Find the inverse of the function.

24. $y = \frac{1}{3}x + 4$

$$x = \frac{1}{3}y + 4$$

$$3(x-4) = \frac{1}{3}y \quad (\times 3)$$

$$3x - 12 = y$$

25. $y = 4x^2 + 9, x \geq 0$

$$x = \sqrt{\frac{y-9}{4}}$$

$$\frac{x-9}{4} = \frac{y-9}{4}$$

$$\sqrt{\frac{x-9}{4}} = \sqrt{\frac{y-9}{4}}$$

Graph the function. Then state the domain and range.

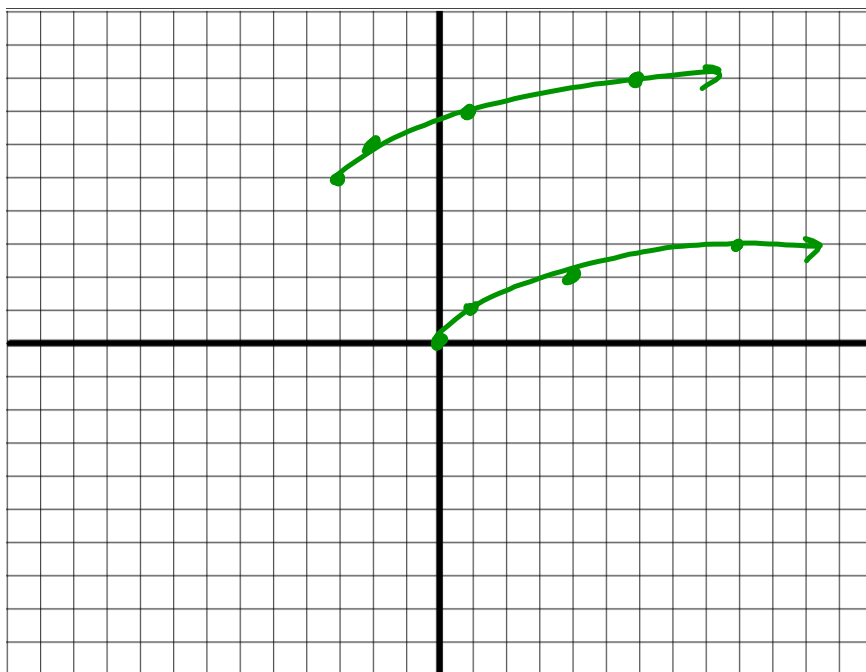
27. $y = \sqrt{x + 3} + 5$

$$y = \sqrt{x}$$

x	y
1	1
4	2
9	3

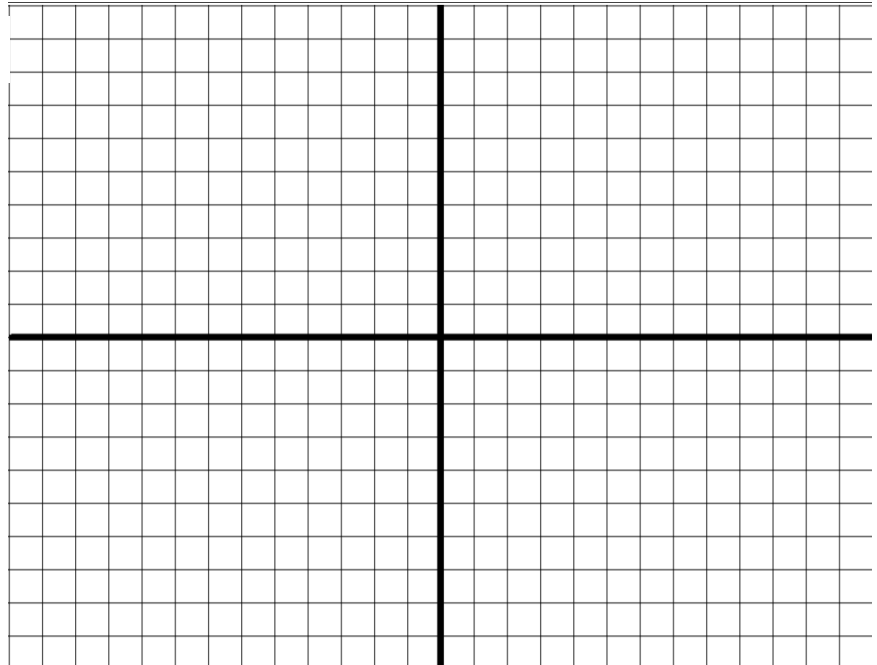
domain: $x \geq -3$

range: $y \geq 5$



Graph the function. Then state the domain and range.

29. $y = \sqrt[3]{x - 4} - 5$



Solve the equation. Check for extraneous solutions.

30. $\sqrt[3]{5x - 4} = 2$

31. $3x^{3/4} = 24$

32. $\sqrt{x^2 - 10} = \sqrt{3x}$