13. $4\sqrt{50x^{16}}$

$4\sqrt{50}\sqrt{x^{16}}$

$4\sqrt{25}\sqrt{2}\ x^{8}$

$4 \cdot 5\sqrt{2}\ x^{8}$

$20x^{8}\sqrt{2}$

20. Write each expression using rational exponents.

a. $\sqrt[2]{12^{1}x^{3}b^{10}}$

$12^{\frac{1}{2}}x^{\frac{3}{2}}b^{\frac{10}{2}}$

$12^{\frac{1}{2}}x^{\frac{3}{2}}b^{5}$

b. $\sqrt[4]{b^{7}}$

$b^{\frac{7}{4}}$

17. $\frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{\sqrt{4}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$

28. The lateral area of a cone with base radius r and height h is given by the formula $L = \pi r\sqrt{r^2 + h^2}$. A cone has a lateral area of 65π square meters and a base radius of 5 meters. What is the height of the cone?

$$\frac{65\pi}{5\pi} = \frac{\pi(5)\sqrt{5^2+h^2}}{5\pi}$$

$$(13)^2 = \left(\sqrt{25+h^2}\right)^2$$

$$169 = 25 + h^2$$

$$\pm\sqrt{144} = \sqrt{h^2}$$

$$\pm 12 = h$$

12 m

$$x^2 \cdot x^7 = x^9 \qquad (x^3)^4 = x^{12}$$

$$\frac{x^{10}}{x^7} = x^3$$

a. $\dfrac{c^{\frac{12}{5}} \cdot c^{\frac{3}{5}}}{c^{3}} = \dfrac{c^{\frac{15}{5}}}{c^{3}} = \dfrac{c^{3}}{c^{3}} = c^{0} = 1$

b. $\left(n^{\frac{3}{\cancel{4}\,1}}\right)^{\frac{\cancel{8}\,2}{5}} = n^{\frac{24}{20}} = n^{\frac{6}{5}}$

c. $\dfrac{x^{\frac{9}{4}}}{x^{\frac{3}{2}}} \cdot \frac{2}{2} = \dfrac{x^{\frac{9}{4}}}{x^{\frac{6}{4}}} = x^{\frac{3}{4}}$

15. $2\sqrt{50} + \sqrt{45} - \sqrt{8}$

$2\sqrt{25}\sqrt{2} + \sqrt{9}\sqrt{5} - \sqrt{4}\sqrt{2}$

$2 \cdot 5\sqrt{2}$

$10\sqrt{2} + 3\sqrt{5} - 2\sqrt{2}$

$8\sqrt{2} + 3\sqrt{5}$

24. $\sqrt[4]{y-9}+4=1$

$\left(\sqrt[4]{y-9}\right)^4=(-3)^4$

$y-9=81$

$\cancel{y=90}$

$\sqrt[4]{90-9}+4=1$

$\sqrt[4]{81}+4=1$

$3+4=1$

$7=1$

no solution

27

$t=\sqrt{\frac{d}{16}}$

$8=\sqrt{\frac{d}{16}}$

$8=\frac{\sqrt{d}}{\sqrt{16}}$

$4(8)=\frac{\sqrt{d}}{4}(4)$

$(32)^2=(\sqrt{d})^2$

$(8)^2=\left(\sqrt{\frac{d}{16}}\right)^2$

$(16)64=\frac{d}{16}(16)$

1024 ft = d

7. Determine (yes/no) whether the functions below are inverse functions. Be sure to show all of the work for both compositions, $[f \circ g](x)$ and $[g \circ f](x)$ to prove.

$f(x) = 10 - \frac{x}{2}$ $\quad$ $g(x) = 20 - 2x$

$f(20-2x) = 10 - \left(\frac{20-2x}{2}\right)$

$= 10 - (10 - x)$

$= 10 - 10 + x$

$= x$

$g\left(10 - \frac{x}{2}\right) = 20 - 2\left(10 - \frac{x}{2}\right)$

$= 20 - 20 + \frac{2x}{2}$

$= \frac{2x}{2}$

$= x$

Yes

21 c. $27^{\frac{1}{3}} \cdot 27^{\frac{5}{3}} = 27^{\frac{6}{3}} = 27^2 = 729$

$\sqrt[3]{27} \cdot \sqrt[3]{27^5}$

14 $(4\sqrt{12})(3\sqrt{20})$

$12\sqrt{240}$

$12\sqrt{16}\sqrt{15}$

$12 \cdot 4\sqrt{15}$

$48\sqrt{15}$

$12\sqrt{4}\sqrt{60}$

$12 \cdot 2\sqrt{60}$

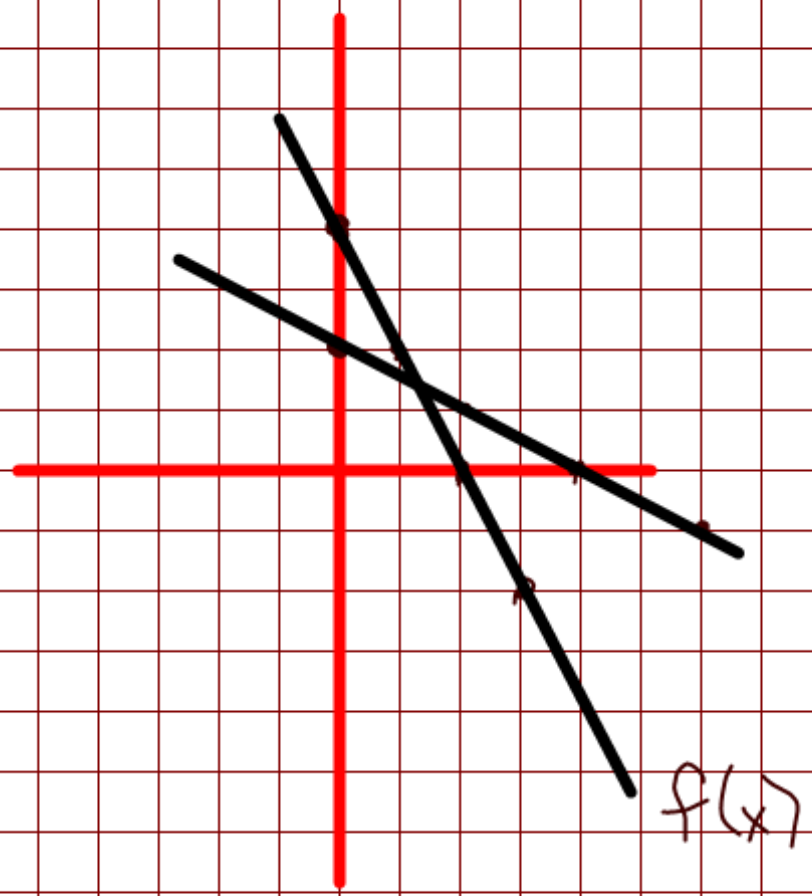
$24\sqrt{60}$

$24\sqrt{4}\sqrt{15}$

$24 \cdot 2\sqrt{15}$

$48\sqrt{15}$

$f^{-1}(x) = -\frac{1}{2}x + 2$


f(x)