*1. Simplify. Use absolute value symbols as needed.

a) $\sqrt{48g^{22}h^{12}k^{15}}$ b) $\sqrt[3]{72R^{27}S^{26}}$ c) $\sqrt[4]{162m^{17}n^{31}}$

*2. Simplify each. Assume that all variables are positive numbers. Make sure denominators are rationalized if necessary.

a) $3\sqrt{150} - 7\sqrt{54} - \sqrt{24}$

b) $\sqrt{12a^5b^6} \cdot \sqrt{18a^7b^3}$

c) $\dfrac{\sqrt[3]{5w^7x^{14}}}{\sqrt[3]{20w^{13}x^5}}$

d) $(8 - 2\sqrt{7})(3 - 5\sqrt{7})$

e) $(11 + \sqrt{13})(11 - \sqrt{13})$

f) $\sqrt[3]{9g^{11}h^2} \cdot \sqrt[3]{15g^6h^5}$

*3. Rationalize each denominator and simplify. Assume all variables are positive numbers.

a) $\dfrac{24a^5}{\sqrt{6a^3b^{11}}}$

b) $\dfrac{12c^8d^2}{\sqrt[3]{25c^8d^{13}}}$

c) $\dfrac{16}{5 + \sqrt{7}}$

d) $\dfrac{17w}{\sqrt[5]{3w^8x^{21}}}$

*4. Rewrite in radical form.   a) $B^{\frac{3}{2}}$ b) $5Q^{\frac{7}{8}}$

*5. Rewrite in exponential form.   a) $\sqrt[6]{11A^5}$ b) $\sqrt[5]{H}$

*6. Simplify each. Assume that all variables are positive numbers.

a) $(6w^{\frac{-3}{4}})^2$

b) $(27c^{12})^{\frac{-5}{3}}$

*7. Solve each equation. Check for extraneous solutions.

a) $\sqrt[3]{5x + 3} = \sqrt[3]{2x - 9}$ b) $6\sqrt{2x + 3} - 8 = 40$ c) $2(x - 5)^{\frac{3}{4}} = 54$

d) $\sqrt{2x + 15} - x = 0$ e) $\sqrt{3x + 37} - 3 = x$

*8. Write the equation of the inverse relation for each function.
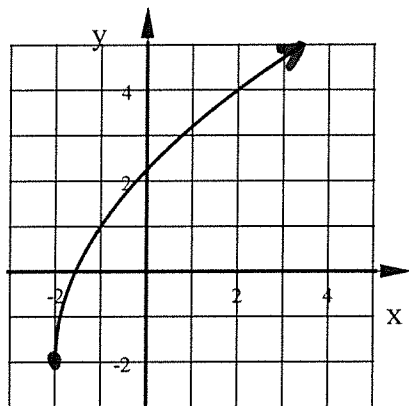
a) $f(x) = \dfrac{3x^5 + 7}{8} + 1$ b) $y = 9 \cdot \sqrt[4]{2x + 5} - 11$ c) $y = 2\left(\dfrac{4x + 7}{11}\right)^3$

*9. Tell if the inverse relation of each is a function or not.

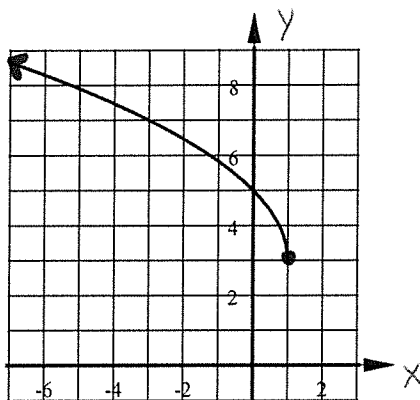a) $y = x^3 + 7x^2$ b) $y = 5 \cdot \sqrt[3]{x + 2} - 1$

*10. Write the equation of each square root function.

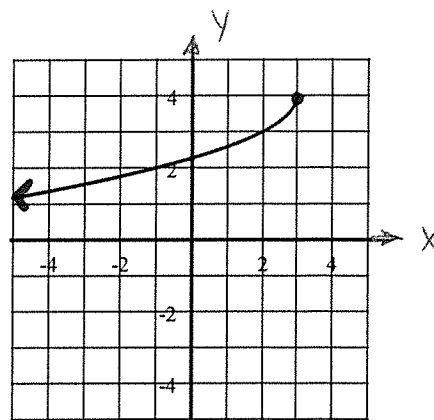a)   b)   c)

*11. Graph each square root function.

a) $y = -4\sqrt{x + 5} + 6$ b) $y = \sqrt{-(x - 3)} + 1$ c) $y = -2\sqrt{-(x + 2)} + 3$

*12. Find the Domain and Range of each Square Root function below

a) $y = -9\sqrt{x + 7} - 12$ b) $y = \sqrt{-(x - 5)} + 8$

13. State the Domain and Range of the inverse relation to the graph shown below.