1. Rewrite the following using a rational (fractional) exponent:

$$\sqrt[3]{x^5} \qquad\qquad \sqrt{x^3}$$

$$\sqrt[5]{x} \qquad\qquad \left(\sqrt[7]{x}\right)^4$$

2. Rewrite the following in radical form:

$$x^{\frac{3}{4}} \qquad\qquad x^{\frac{5}{4}}$$

$$x^{-\frac{1}{3}} \qquad\qquad x^{\frac{1}{2}}$$

3. Simplify $36^{\frac{3}{2}}$
4. Simplify $64^{\frac{2}{3}}$
5. Solve $x^2 - 20 = -84$

6. Solve. Make sure to check for extraneous solutions!

$$3\sqrt{3x+7} = 15$$

7. Solve
$$x = \sqrt{13x - 30}$$
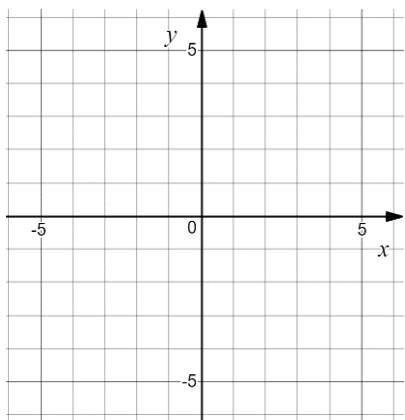
8. Solve
$$\sqrt{x+2} + 4 = 1$$

9. Solve
$$\sqrt{3x+1} = \sqrt{x+3}$$

10. Solve
$$5 = \sqrt[3]{x - 10}$$

11. Graph $f(x) = \sqrt{x-2} + 3$

12. Simplify: $\sqrt[3]{5x^4} \cdot \sqrt[3]{x^2} \cdot \sqrt[3]{25x^3}$

13. $\sqrt[3]{\dfrac{243x^4}{3x}}$

$$f(x) = x^2 + 4x + 3 \qquad g(x) = x + 1 \qquad h(x) = x^2 \qquad m(x) = \sqrt{x+2}$$

Perform the indicated operation and simplify:

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

15. $f(x) \cdot h(x)$

16. $h(x) - f(x)$

17. $\dfrac{f(x)}{g(x)}$ and give the domain

18. $h \circ m$

19. $m \circ h$

20. $g(m(7))$

21. Identify the inverse of the relation:

Relation

x	-2	-1	0	1	2	3
y	-6	-3	1	2	4	7

Inverse

x						
y						

Is the inverse a function? Explain.

_____
_____
_____

22. Find an equation of the inverse function.

$f(x) = 3x - 5$

23. Hillary said the inverse of $f(x) = 2x - 3$ is $f^{-1}(x) = \dfrac{1}{2}x + 3$. Is she correct? Use a graph or compositions to explain how you know and make sure to SHOW WORK!