pg. 404 #3-42 x3, 64

3.

x	y
0	0
1	1
2	4
3	9

inverse

x	y
0	0
1	1
4	2
9	3

6. $y = 2x - 1$ switch x & y $x = 2y - 1$

solve for y $x + 1 = 2y$

$\frac{x+1}{2} = y$

yes $y = \frac{x+1}{2}$ is a function.

15. graph paper

24. f {domain $5 \le x < \infty$, range $0 \le y < \infty$} f^{-1} {domain $0 \le x < \infty$, range $5 \le y < \infty$}

$f(x) = \sqrt{x-5}$ switch $x = \sqrt{y-5}$

solve $x^2 = y - 5$

$x^2 + 5 = y$ if $x \ge 0$ (because of original range)

yes, $y = x^2 + 5$ is a function.

33. since f is linear, it will have an inverse.
Therefore $(f^{-1} \circ f)(0.2) = 0.2$

36. $f(x) = \frac{3x^2}{4}$ switch $x = \frac{3y^2}{4}$

solve $\frac{4}{3}x = y^2$

$\pm\sqrt{\frac{4}{3}x} = y = \pm 2\sqrt{\frac{1}{3}x}$

no, the inverse is not a function

64. $f(x) = \sqrt[3]{x-5}$ switch & solve $x = \sqrt[3]{y-5}$

$x^3 = y-5$

$x^3+5 = y$

yes, $y = x^3+5$ is a function

30. $V = \frac{4}{3}\pi r^3$ solve for r $V = \frac{4}{3}\pi r^3$

$\frac{3}{4}V = \pi r^3$

a.

$\frac{3V}{4\pi} = r^3$

$\sqrt[3]{\frac{3V}{4\pi}} = r$ yes, fcn.

b. solve for r. $V = \frac{4}{3}\pi r^3$

$\frac{3V}{4\pi} = r^3$

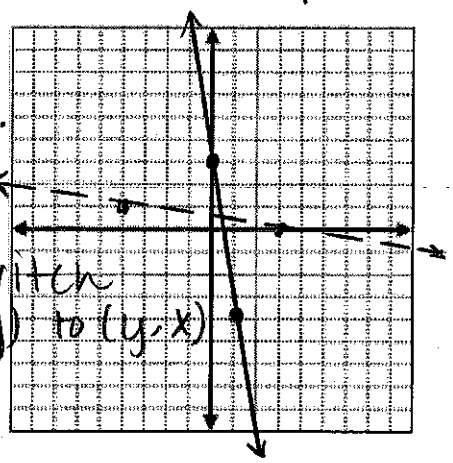
$\sqrt[3]{\frac{3V}{4\pi}} = r$ substitute $V = 35000\ ft^3$

$\sqrt[3]{\frac{3(35{,}000)}{4\pi}} = r$

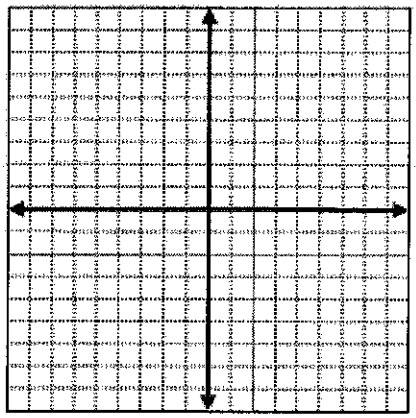
$20.29\ ft \approx r$

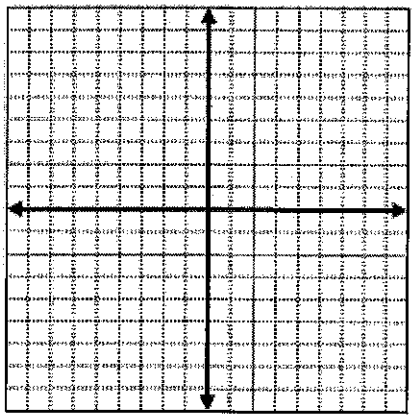
f is bolder. f^{-1} is dotted

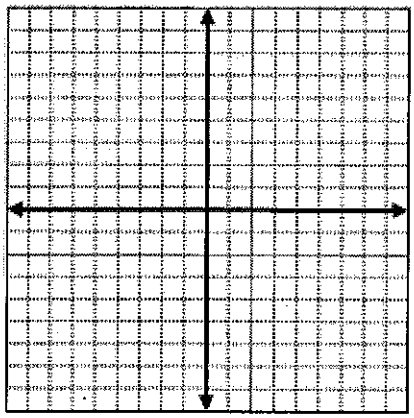
15.

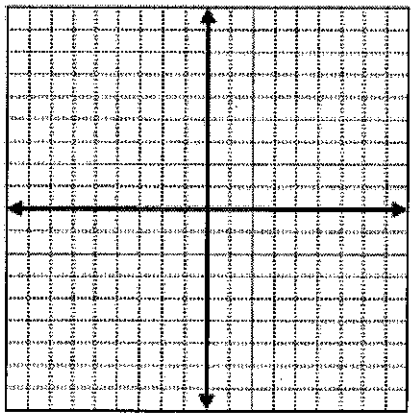


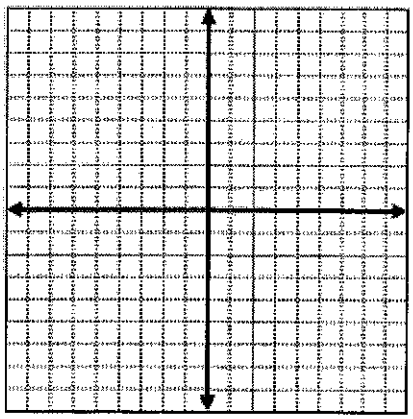
switch (x, y) to (y, x)

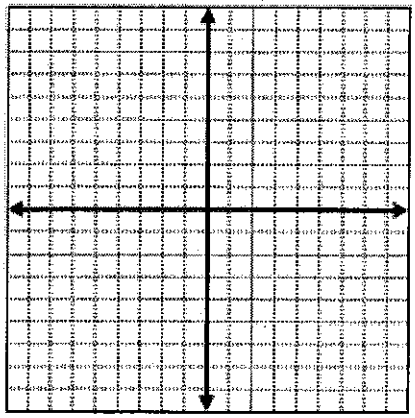


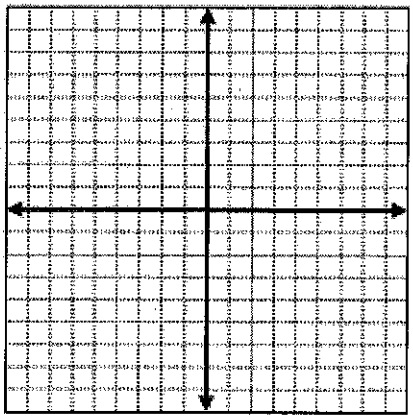


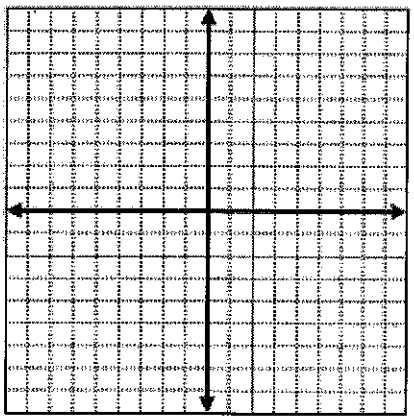


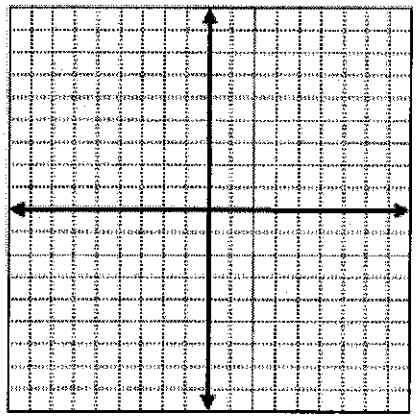


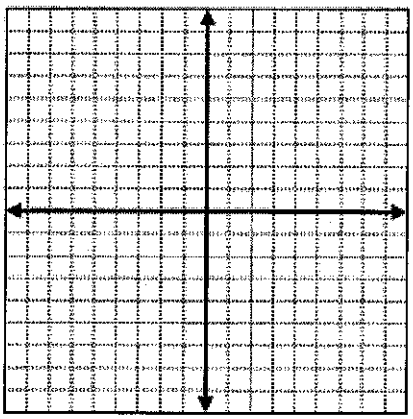






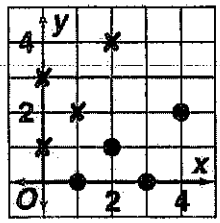






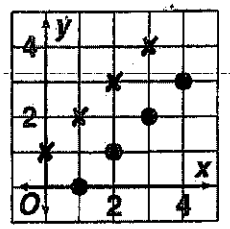
1.

x	0	1	0	2
y	1	2	3	4



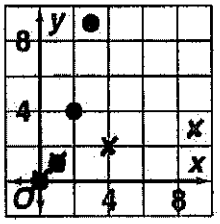
2.

x	0	1	2	3
y	1	2	3	4



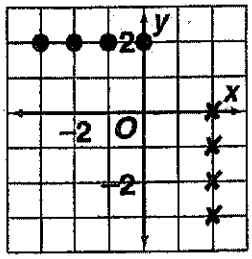
3.

x	0	1	4	9
y	0	1	2	3



4.

x	2	2	2	2
y	−3	−2	−1	0



5. $y = \frac{1}{3}x - \frac{1}{3}$; yes

6. $y = \frac{1}{2}x + \frac{1}{2}$; yes

7. $y = -\frac{1}{3}x + \frac{4}{3}$; yes

8. $y = y = \pm\sqrt{\frac{5 - x}{2}}$; no

9. $y = \pm\sqrt{x - 4}$; no

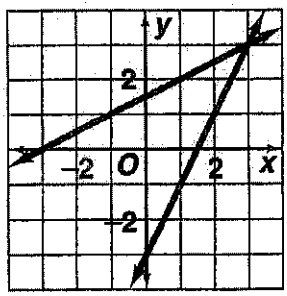
10. $y = \pm\sqrt{\frac{x + 5}{3}}$; no

11. $y = \pm\sqrt{x} - 1$; no

12. $y = \pm\frac{\sqrt{x} + 4}{3}$; no

13. $y = \pm\frac{\sqrt{x - 5} - 1}{2}$; no

14.



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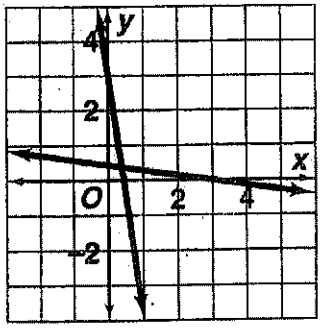
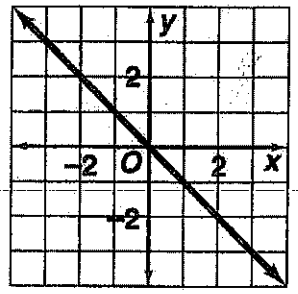
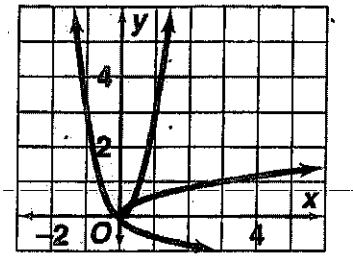
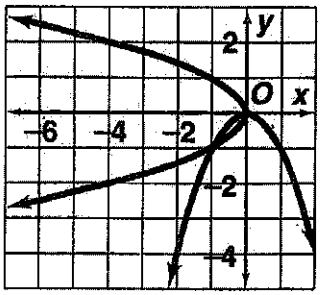
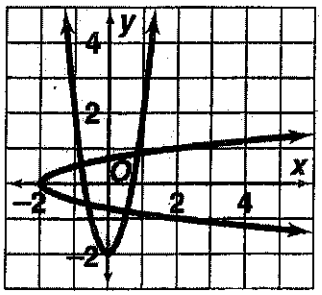
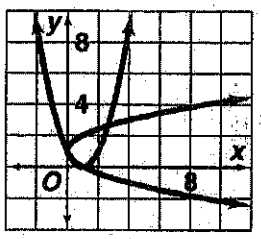


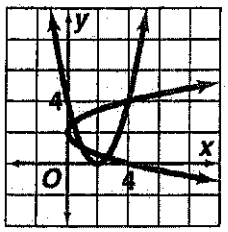
16. 

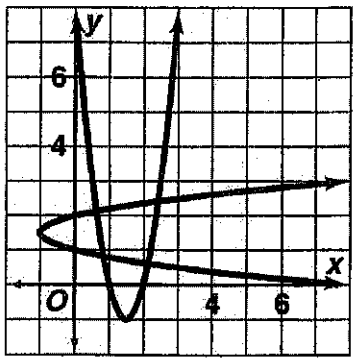
17. 

18. 

19. 

20. 

21. 

22. 

23. $f^{-1}(x) = \frac{x-4}{3}$, and the domain and range for both f and f^{-1} are all real numbers; f^{-1} is a function.

24. $f^{-1}(x) = x^2 + 5 \ \ x \geq 0$, domain f: $\{x|x \geq 5\}$, range f: $\{y|y \geq 0\}$, domain f^{-1}: $\{x|x \geq 0\}$, and range f^{-1}: $\{y|y \geq 5\}$; f^{-1} is a function.

25. $f^{-1}(x) = x^2 - 7$ $x \geq 0$, domain f: $\{x|x \geq -7\}$, range f: $\{y|y \geq 0\}$, domain f^{-1}: $\{x|x \geq 0\}$, and range f^{-1}: $\{y|y \geq -7\}$; f^{-1} is a function.

26. $f^{-1}(x) = \frac{3 - x^2}{2}$ $x \geq 0$, domain f: $\{x|x \leq \frac{3}{2}\}$, range f: $\{y|y \geq 0\}$, domain f^{-1}: $\{x|x \geq 0\}$, and range f^{-1}: $\{y|y \leq \frac{3}{2}\}$; f^{-1} is a function.

27. $f^{-1}(x) = \pm\sqrt{\frac{x - 2}{2}}$ $x \geq 2$, domain f: all reals, range f: $\{y|y \geq 2\}$, domain f^{-1}: $\{x|x \geq 2\}$, and range f^{-1}: all reals; f^{-1} is not a function.

28. $f^{-1}(x) = \pm\sqrt{1 - x}$ $x \leq 1$, domain f: all reals, range f: $\{y|y \leq 1\}$, domain f^{-1}: $\{x|x \leq 1\}$, and range f^{-1}: all reals; f^{-1} is not a function.

29. **a.** $F = \frac{5}{9}(C - 32)$; yes

b. $-3.89°F$

30. **a.** $r = \sqrt[3]{\frac{3V}{4\pi}}$; yes

b. 20.29 ft

31. 10 **32.** -10 **33.** 0.2 **34.** d

35. $f^{-1}(x) = \pm\sqrt{\frac{2x + 8}{3}}$ no **36.** $f^{-1}(x) = \pm 2\sqrt{\frac{x}{3}}$; no

37. $f^{-1}(x) = \frac{x^2 - 6x + 10}{2}$, $x \geq 3$; yes

38. $f^{-1}(x) = \pm\sqrt{x} - 1$; no **39.** $f^{-1}(x) = \frac{1 \pm \sqrt{x}}{2}$; no

40. $f^{-1}(x) = -1 \pm \sqrt{x + 1}$; no

41. $f^{-1}(x) = \sqrt[3]{x}$; yes **42.** $f^{-1}(x) = \pm\sqrt[4]{x}$; no

43. $f^{-1}(x) = \pm\sqrt{\frac{5x - 5}{2}}$; no **44.** $x = \frac{V^2}{64}$; 25 ft, 6.25 ft

45. The range of the inverse is the domain of f, which is $x \geq 1$.

64. $y = x^3 + 5$; yes

/15