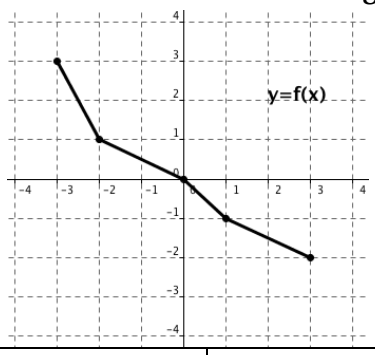
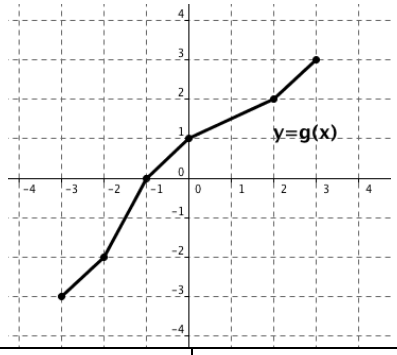
A2H – Chapter 3 Review Worksheet

Use the graphs above to evaluate the following, if possible.





1. (f+g)(-2)	2. (f – g)(3)	3. $(f^{-1}(g^{-1}(0))$
4. $\left(f^{-1}\cdot g\right)(-2)$	5. $\left(\frac{g}{f}\right)(0)$	6. $\left(g(f^{-1}(1)\right)$
7. $f^{-1}(-2)$	8. $(f(f(3))$	9. $\left(f^{-1}(f(3)\right)$

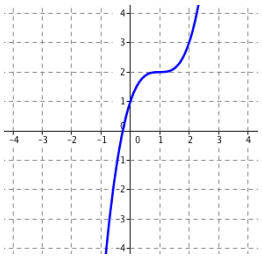
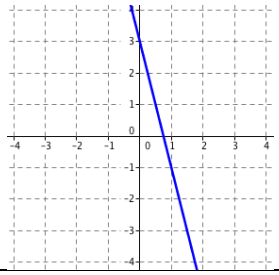
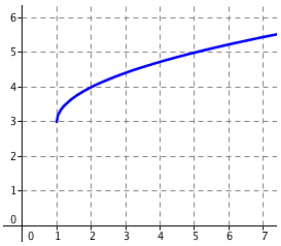
Determine if f(x) and g(x) are inverse functions algebraically.

10. $f(x)=\sqrt{x-4}$ g(x) = x^2 + 4	11. f(x) = 2x – 5 $g(x)=\frac{1}{2}x+\frac{5}{2}$

Given f(x), find f^{-1}(x).

12. $f(x)=\sqrt[3]{x-7}+4$	13. $f\left(x\right)=\frac{x}{x+5}$

Sketch the inverse function.

14 	15. 	16. 

17. **Does f(x) have an inverse function? Explain your reasoning.**

a) f(x) = { (2, 3), (4, -8), (5, -6) (9, 8) (-3, 3) }

b) $f(x)=-x^2+2x-4$

c) $f(x)=\sqrt{2x-5}$

Find the desired expression (if possible). Then state the domain in set notation.

f(x) = $-x^2$ + 4x – 3 $g\left(x\right)=\sqrt{3x+24}$ $m(x)=x+3$ $h(x)=5x^{-1}$

18. $(f-m)(x)$	19. f(m(x))	20. $h(g(x))$
21. $\left(h\circ h\right)\left(x\right)$	22. $\left(h\circ m\right)\left(x\right)$	23. $(f\cdot m)(x)$

Evaluate (if possible).

$f(x) = -x^2 - 4x - 3$ $\quad g(x)=\sqrt{3x+26}$ $\quad h(x)=\dfrac{5}{x+3}$ $\quad m(x)=-x$

24. $(h+g)\left(-\frac{1}{3}\right)$	25. $(f-m)(-2)$	26. $g^{-1}(h^{-1}(0.5))$

Sketch the graphs, then state the domain and range in interval notation.

27. $f(x)=5-\sqrt{x+1}$	28. $f(x)=\sqrt[3]{x-6}+1$
29. $f(x)=-\sqrt[3]{x}-2$	30. $f(x)=\frac{1}{2}\sqrt{6-3x}+1$

Solve. Check for extraneous solutions.

31. $(2x)^{1/2}+4=x$	32. $46=19-(x+11)^{3/2}$	33. $\sqrt{4x-4}=\sqrt{5x-1}-1$	34. $\sqrt[4]{8x^2-1}=2x$
35. $2(x+1)^{4/3}-1=31$	36. $\sqrt[5]{3x-5}=\sqrt[5]{x+9}$	37. $5=9-(x-2)^{1/3}$	

Simplify, rationalize when necessary.

38. $\sqrt[5]{\frac{3}{8xy^2}}$	39. $\sqrt[4]{162a^2b^4c^6d^8}$	40. $\sqrt[3]{-256x^4y^9z^8}$	41. $\left(\sqrt[3]{x^2}\cdot\sqrt[5]{x^4}\right)^3$

Evaluate the expression and simplify.

42. $256^{-3/4}$	43. $\left(\sqrt[3]{8}\right)^7$	44. $-27^{2/3}$	45. $22\sqrt[4]{4}+\sqrt[3]{-81}-7\sqrt[4]{64}$

46. Let $h(x)=\dfrac{4x+5}{2x-7}$ and $f(x)=x+6$. If $h(x)=(g\circ f)(x)$, then $g(x)$ is?

a) $\dfrac{4x+1}{2x-13}$ b) $\dfrac{4x+1}{2x+13}$ c) $\dfrac{4x}{2x}-\dfrac{5}{7}$ d) $\dfrac{4x-19}{2x-5}$ e) $\dfrac{4x-19}{2x-19}$

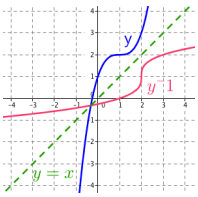
47.

Assume f is a one-to-one function.

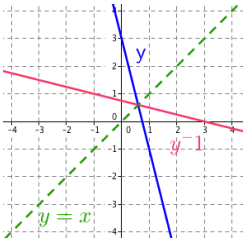
(a) If $f(2)=9$, find $f^{-1}(9)$ (b) If $f^{-1}(-3)=1$, find $f(1)$ (c) if $f(x)=5-2x$, find $f^{-1}(-3)$

ANSWERS

1. -1
2. -5
3. 1
4. -6
5. undefined
6. -2
7. 3
8. 1
9. 3
10. No, $(f(g))(x) = |x|$
11. Yes, both $(f \circ g)(x) = x$ and $(g \circ f)(x) = x$
12. $f^{-1}(x) = (x-4)^3 + 7$
13. $f^{-1}(x) = -\dfrac{5x}{x-1}$
14.



15.



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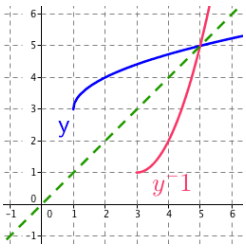
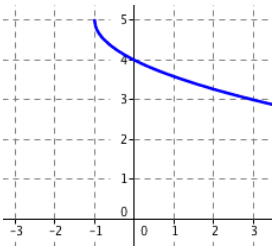


17a)No, since f(x) contains the points (2,3) and (-3,3) f(x) is not one-to-one and does not have an inverse function.

17b) No, f(x) is a parabola. A parabola is not one-to-one and does not have an inverse function.

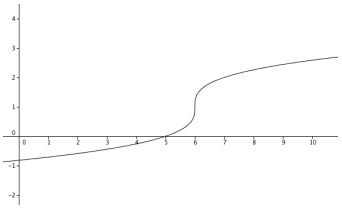
17c) Yes, f(x) is a one-to-one function.

18. $-x^2 + 3x - 6$; $\{x] x \varepsilon R\}$
19. $-x^2 - 2x$; $\{x] x \varepsilon R\}$
20. $\dfrac{5}{\sqrt{3x+24}}$; $\{x] x > -8\}$
21. x ; $\{x] x \neq 0\}$
22. $\dfrac{5}{x+3}$; $\{x] x \neq -3\}$
23. $-x^3 + x^2 + 9x - 9$; $\{x] x \varepsilon R\}$
24. 55/8
25. -1
26. 23/3
27.



D: [-1, ∞)
R: (-∞, 5]

28.



D: (-∞, ∞)
R: (-∞, ∞)

29.

31. 8
32. no solution
33. 2, 10
34. 1/2
35. -9, 7

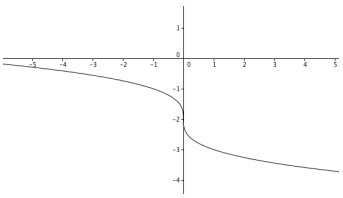
36. 7
37. 66

38. $\dfrac{\sqrt[5]{12x^4y^3}}{2xy}$

39. $3|bc|d^2\sqrt[4]{2a^2c^2}$

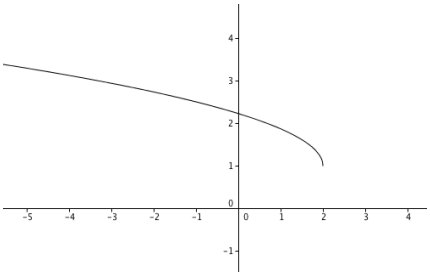
40. $-4xy^3z^2\sqrt[3]{4xz^2}$

41. $x^{22/5} = x^4\sqrt[5]{x^2}$



D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

30.



D: $[-\infty, 2]$
R: $[1, \infty)$

42. 1/64
43. 128
44. -9
45. $8\sqrt[4]{4} - 3\sqrt[3]{3}$
46. E
47.
a) 2
b) -3
c) 4