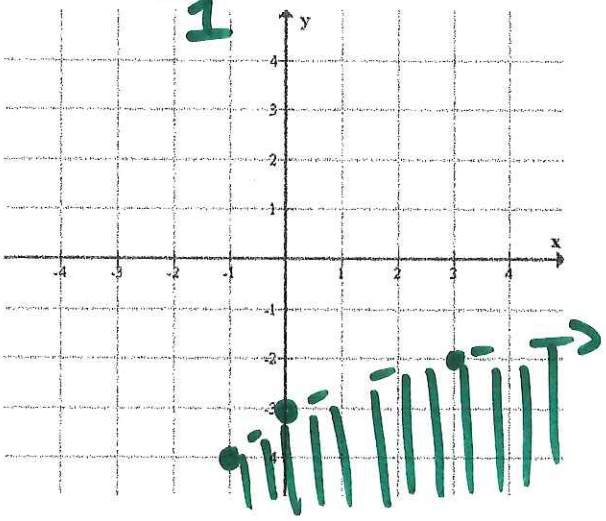
PAP Algebra 2

4.11 – Unit 4 Review (Square Root Functions)

Name _____

Date _____ Period _____

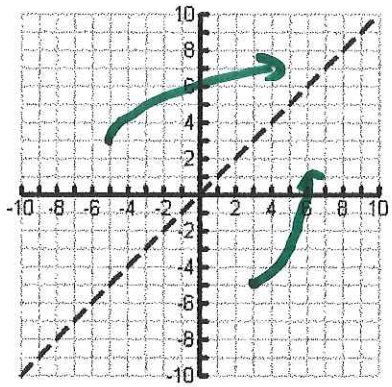
1. Graph $y < \sqrt{x+1} - 4$ ↓4 ←1



Are the following solutions?

(0, -3) NO (3, -5) Yes (7, 2) NO (-1, -5) Yes

2.



Sketch the graph of $f(x) = \sqrt{(x+5)} + 3$

Domain - $[-5, \infty)$

Range - $[3, \infty)$

$x = \sqrt{y+5} + 3$

$x - 3 = \sqrt{y+5}$

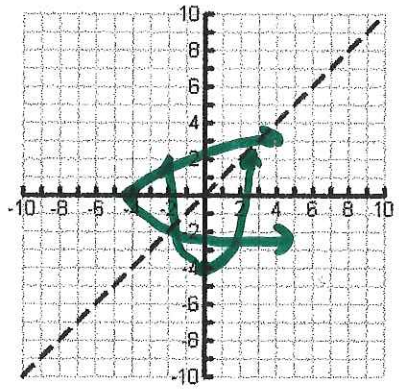
$(x-3)^2 = y+5$

Find and sketch the inverse - $y = (x-3)^2 - 5,\ x \geq 3$

Domain - $[3, \infty)$

Range - $[-5, \infty)$

3.



Sketch the graph of $y = x^2 - 4$ $x = y^2 \mp 4$, $x + 4 = y^2$

Domain - $(-\infty, \infty)$

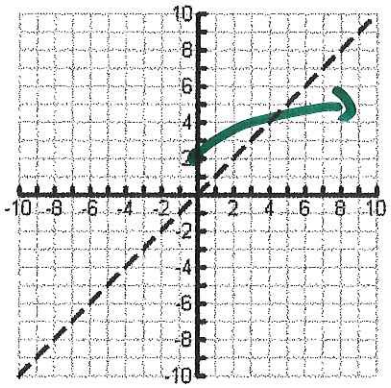
Range - $[-4, \infty)$

Find and sketch the inverse - $y = \pm\sqrt{x+4}$

Domain - $[-4, \infty)$

Range - $(-\infty, \infty)$

4.



Sketch the graph of $y = \sqrt{x} + 2$ $x = \sqrt{y} + 2$, $x - 2 = \sqrt{y}$

Domain - $[0, \infty)$

Range - $[2, \infty)$

Find and sketch the inverse - $y = (x-2)^2,\ x \geq 2$

Domain - $[2, \infty)$

Range - $[0, \infty)$

Given the following equations, find: $f(g(x))$ and $g(f(x))$	$f(g(x))$	$g(f(x))$
5. $f(x)=4x$ $g(x)=x^2-x+1$	$4(x^2-x+1)$ $4x^2-4x+4$	$(4x)^2-(4x)+1$ $16x^2-4x+1$
6. $f(x)=\sqrt{x-4}$ $g(x)=2x^2-1$	$\sqrt{(2x^2-1)-4}$ $\sqrt{2x^2-5}$	$2(\sqrt{x-4})^2-1$ $2(x-4)-1$ $2x-8-1$ $2x-9$

7.

$y=\sqrt{x-2}+1$

Domain - $[2,\infty)$

Range - $[1,\infty)$

What would the new equation be if we shifted this graph 4 units left and 3 units down?

$y=\sqrt{x+2}-2$

8.

$y=2\sqrt{x-1}-3$

Domain - $[1,\infty)$

Range - $[-3,\infty)$

What would the new equation be if we shifted this graph 5 units right and 2 units down?

$y=2\sqrt{x-6}-5$

9.

$y=-\sqrt{(x+4)}-1$

Domain - $[-4,\infty)$

Range - $(-\infty,-1]$

What would the new equation be if we shifted this graph 2 unit left and 3 units up?

$y=-\sqrt{x+6}+2$

10.

$y=-2\sqrt{x}-5$

Domain - $[0,\infty)$

Range - $(-\infty,-5]$

What would the new equation be if we shifted this graph 4 units right and 3 units up?

$y=-2\sqrt{x-4}-2$

Solve the following radicals. Check your solution(s).

11. $\sqrt{2x-7}+4=1$

$\sqrt{2x-7}=-3$

$2x-7=9$

$2x=16$

$x=8$

NO SOL

12. $\sqrt{3x+4}-6=-2$

$\sqrt{3x+4}=4$

$3x+4=16$

$3x=12$

$x=4$

13. $\sqrt[3]{6x+2}=2$

$6x+2=32$

$6x=30$

$x=5$

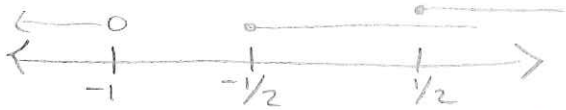
14. $5=\sqrt[3]{(12x+5)}$

$125=12x+5$

$120=12x$

$x=10$

Solve the following inequalities.



15. $12-\sqrt{c+4}\le 4$

$-\sqrt{c+4}\le -8$

$c+4\ge 64$

$c\ge 60$

$c+4\ge 0$

$c\ge -4$

$[60,\infty)$

16. $\sqrt{2x-1}\ge\sqrt{6x+3}$

$2x-1\ge 6x+3$

$-4x\ge 4$

$x\le -1$

$2x-1\ge 0$ $\quad x\ge \frac{1}{2}$

$6x+3\ge 0$ $\quad x\ge -\frac{1}{2}$

NO SOL.

17. $\sqrt{x+1}>11$

$x+1>121$

$x>120$

$x+1\ge 0$

$x\ge -1$

$(120,\infty)$

18. $9-\sqrt{4x+4}\ge 3$

$-\sqrt{4x+4}\ge -6$

$4x+4\le 36$

$4x\le 32$

$x\le 8$

$4x+4\ge 0$

$4x\ge -4$

$x\ge -1$

$[-1,8]$

19. Helena drops a ball from 25 feet above a lake. The formula $t=\frac{1}{4}\sqrt{25-h}$ describes the time t in seconds that the ball is h feet above the water. Where will the ball be after 2 seconds?

$2=\frac{1}{4}\sqrt{25-h}$

$8=\sqrt{25-h}$

$64=25-h$

$-h=39$

$h=-39$

39 feet underwater!

22. Find the perimeter of a triangle with sides of $3+\sqrt{3}$ and $2-\sqrt{3}$ and $4+\sqrt{3}$

$9+\sqrt{3}$

23. Simplify $(-5x^3)^4$

$625x^{12}$

24. Simplify: $3x^{1/3}\cdot 2x^{1/5}$

$\frac{5}{15}+\frac{3}{15}=\frac{8}{15}$

$6x^{8/15}$

25. Simplify: $(2x^3y)(x^2y^3)(x^7)$

$2x^{12}y^4$

26. Simplify $(\sqrt{3}+5)(\sqrt{2}+3)$

$\sqrt{6}+3\sqrt{3}+5\sqrt{2}+15$

27. Simplify $(9-\sqrt{12})^2$

$\sqrt{12}=2\sqrt{3}$

$81-36\sqrt{3}+12=93-36\sqrt{3}$

31. Simplify $(2\sqrt{3}+7)(6\sqrt{3}-5)$

$12\cdot3 - 10\sqrt{3} + 42\sqrt{3} - 35$

$+32\sqrt{3}$

32. Simplify $16^{1/4}$

2

33. Simplify: $\left(-2x^9\right)^2$

$4x^{18}$

34. Simplify: $\left(\frac{5}{y}\right)^{-3}$

$\frac{y^3}{125}$

35. Simplify: $5\left(x^2y^{23}\right)^0+3$

$5+3 = 8$

36. Simplify $\sqrt{40x^6y^5}$

$= \sqrt{4\cdot10x^6y^4y}$

$2x^3y^2\sqrt{10y}$

37. Simplify $(2\sqrt{3}+7)+(6\sqrt{3}-5)$

$8\sqrt{3}+2$

38. Simplify $(2\sqrt{3}+7)-(6\sqrt{3}-5)$

$-4\sqrt{3}+12$

39. Write in radical form: $y^{4/5}$

$\sqrt[5]{y^4}$

40. Change $\sqrt[5]{2x^3}$ to rational exponent form:

$2^{1/5}x^{3/5}$

41. Match

B $(-3)^2$	A 1
D -3^2	B 9
A $(-3)^0$	C -1
C -3^0	D -9

42. Match

D $3x^{-4}$	A $\frac{x^4}{3}$
B $\frac{1}{(3x)^{-4}}$	B $81x^4$
C $(3x)^{-4}$	C $\frac{1}{81x^4}$
A $\frac{1}{3x^{-4}}$	D $\frac{3}{x^4}$

43. Given a rectangle with an area of $12x^7y^3$ and a width of $3x^4y^5$ find the length.

$A = l\cdot w$

$l = \frac{A}{w}$

$\frac{12x^7y^3}{3x^4y^5} = \frac{4x^3}{y^2}$

44. Simplify: $\frac{9}{\sqrt{6}}\cdot\frac{\sqrt{6}}{\sqrt{6}}$

$\frac{9\sqrt{6}}{6} = \frac{3\sqrt{6}}{2}$

45. Simplify: $\frac{9}{3-\sqrt{6}}\ (3+\sqrt{6})$

$(3+\sqrt{6})$

$\frac{27+9\sqrt{6}}{9-6} = \frac{27+9\sqrt{6}}{3}$

$= 9+3\sqrt{6}$