

66

Simplify. **SHOW ALL WORK** (Only use your calculator to check your answer.) (No fractional exponents can be left in your answer). **WRITE ALL ANSWERS IN RADICAL FORM!!! Simplify!!!**

<p>1. $2^{\frac{1}{2}} \cdot 32^{\frac{1}{2}}$ $(2 \cdot 32)^{1/2}$ $64^{1/2}$ <u>8</u> C +2</p>	<p>2. $\sqrt[3]{5} \cdot \sqrt{5^2}$ $5^{1/3} \cdot 5^{2/1}$ $5^{13/21}$ +3</p> <p>$\frac{1}{3} + \frac{2}{7}$ $\frac{7}{21} + \frac{6}{21}$ $\frac{13}{21}$ $\sqrt[21]{5^{13}}$</p>
<p>3. $3^{\frac{3}{4}} \cdot 3^{\frac{5}{4}}$ $3^{8/4} = 3^2 = 9$ <u>9</u> C +2</p>	<p>4. $\left(\frac{x^{\frac{1}{3}}}{y^{\frac{1}{2}}}\right)^{-6} = \frac{x^2}{y^{-3}}$ <u>$x^2 y^3$</u> +3</p>

Solve each radical equation. If the equation has no solution, write *no solution*. Check you solutions. **SHOW WORK.**

<p>5. $6\sqrt{2x-4} = 36$ $\sqrt{2x-4} = 6$ $2x-4 = 36$ $2x = 40$ <u>20</u> +3</p>	<p>6. $2(x-6)^{\frac{2}{3}} = 8$ $(x-6)^{2/3} = 4$ $(x-6)^2 = 4^3$ $(x-6)^2 = 64$ $\sqrt{(x-6)^2} = \sqrt{64}$ $x-6 = \pm 8$ $x = 6 \pm 8$ <u>14, -2</u> +3</p>
<p>7. $\sqrt{5x+14} = x$ $5x+14 = x^2$ $x^2 - 5x - 14$ $(x-7)(x+2)$ $x = 7$ $x = -2$ <u>7</u> +3</p>	<p>8. $(6x+9)^{\frac{1}{3}} - 5 = -2$ $(6x+9)^{1/3} = 3$ $6x+9 = 27$ $6x = 18$ <u>$x = 3$</u> +3</p>

Let $f(x) = x^2 + 2x - 15$ and $g(x) = x + 5$. Perform each function operation and then find the domain. Be sure to write the function in standard form.

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

$$x^2 + 2x - 15 + x + 5$$

9. $\frac{x^2 + 3x - 10}{\text{arn}}$ ⁺²
D: arn ⁺¹

10. $(f-g)(x)$

$$(x^2 + 2x - 15) - (x + 5)$$

10. $\frac{x^2 + x - 20}{\text{arn}}$ ⁺²
D: arn ⁺¹

11. $(f \cdot g)(x)$

$$(x^2 + 2x - 15)(x + 5)$$

$$x^3 + 5x^2 + 2x^2 + 10x - 15x - 75$$

11. $\frac{x^3 + 7x^2 - 5x - 75}{\text{arn}}$ ⁺²
D: arn ⁺¹

12. $\left(\frac{f}{g}\right)(x)$

$$\frac{x^2 + 2x - 15}{x + 5} \cdot \frac{(x + 5)(x - 3)}{x + 5}$$

12. $\frac{x - 3}{\text{arn}}$ ⁺²
D: arn $x \neq -5$ ⁺¹

Let $f(x) = x^2 - 1$ and $g(x) = x - 2$. Solve each. Simplify all answers. Show all work.

13. $2f(x) - (g(x))$

$$2(x^2 - 1) - (x - 2)$$

$$2x^2 - 2 - x + 2$$

13. $\frac{2x^2 - x}{\text{arn}}$ ⁺²

14. $(g \circ f)(-5)$

$$g(24)$$

14. $\frac{22}{\text{arn}}$ ⁺²

15. $(f \circ g)(x)$

$$(x - 2)^2 - 1$$

$$x^2 - 4x + 4 - 1$$

15. $\frac{x^2 - 4x + 3}{\text{arn}}$ ⁺²

Find the inverse of each function. Use correct inverse notation when possible. Is the inverse a function? **SHOW ALLWORK.**

16. $f(x) = -3x - 4$

$y = -3x - 4$
 ~~$x = \frac{3y - 4}{-3}$~~
 $\frac{x + 4}{-3} = y$

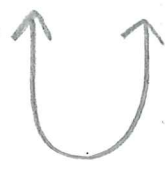


16. $f^{-1}(x) = -\frac{1}{3}x - \frac{4}{3}$
 Is the inverse a function? yes

4

17. $f(x) = x^2 - 4$

$y = x^2 - 4$
 $x = y^2 - 4$
 $\pm\sqrt{x+4} = y$



17. $y = \pm\sqrt{x+4}$
 Is the inverse a function? no

4

18. $f(x) = \sqrt{x-5}$

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



18. $f^{-1}(x) = x^2 + 5$
 Is the inverse a function? yes

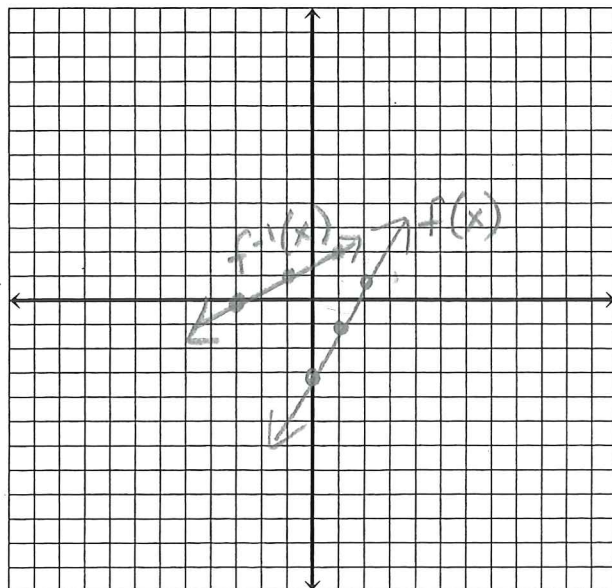
4

Graph each relation and its inverse. LABEL EACH! Is the inverse a function?

17. $y = 2x - 3$

17. Is the inverse a function? yes

x	y	x	y
0	-3	-3	0
1	-1	-1	1
2	1	1	2



+4

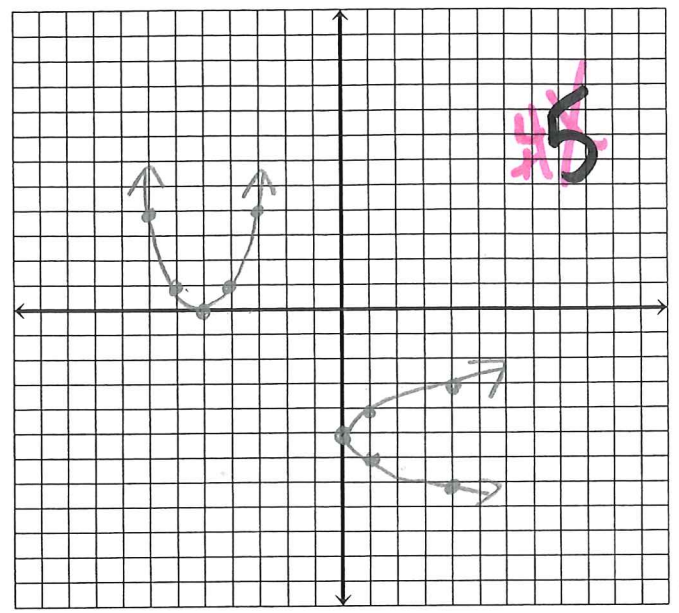
16

18. $f(x) = (x+5)^2$

18. Is the inverse a function? NO +1

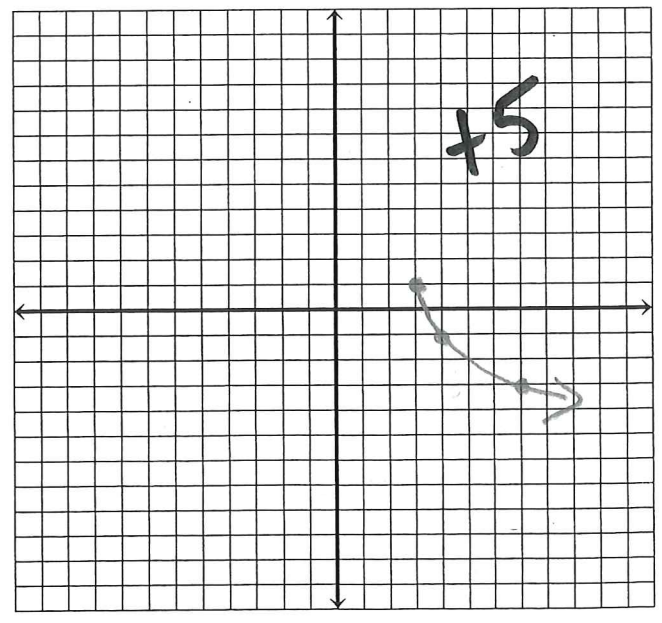
x	y
-5	0

x	y
0	-5



19. Graph the following function: $f(x) = -2\sqrt{x-3} + 1$

$y = \sqrt{x}$		$x+3$				x	y
x	y	x	y				
0	0	3	0		0	3	1
1	1	4	1		-2	4	-1
4	2	7	2		-4	7	-3
9							
25							
36							



10