

Names

Joey Porello

1. Find  $f(3)$  when  $f(x) = 3x^2 - 8x + 9$ . Write your answer as an ordered pair.

$$\begin{aligned} f(3) &= 3(3)^2 - 8(3) + 9 \\ &= 27 - 24 + 9 \\ &= 12 \end{aligned}$$

$$(3, 12)$$

2. Find  $f(-3)$  when  $f(x) = 2x^2 + 9x - 4$ . Write your answer as an ordered pair.

$$\begin{aligned} f(-3) &= 2(-3)^2 + 9(-3) - 4 \\ &= 18 - 27 - 4 \\ &= -13 \end{aligned}$$

$$(-3, -13)$$

- Find  $f(-5)$  when  $f(x) = 3x^2 - 8x + 9$ . Write your answer as an ordered pair.

$$\begin{aligned} f(-5) &= 3(-5)^2 - 8(-5) + 9 \\ &= 75 + 40 + 9 \\ &= 124 \end{aligned}$$

$$(-5, 124)$$

Names Jovana Atrisco ALVIN. L

3. Find the domain and range of the relation  $\{(9, 3), (5, 3), (4, 2), (-8, 1)\}$ . Write your answer in set-builder notation.

Domain  $\{x | x = 9, 5, 4, -8\}$

~~$\{0, 4, 5, 9\}$~~

Range  $\{y | y = 3, 2, 1\}$

$\{1, 2, 3\}$

4. Find the domain and range for the function  $f(x) = 3x - 7$ . Write your answer in set-builder notation.

Domain  $\{x | x = -\infty, \infty\}$  not set builder notation

Range  $\{y | y = -\infty, \infty\}$

say this:  
 Domain =  $\{x | x \text{ is a real number}\}$   
 Range =  $\{y | y \text{ is a real number}\}$

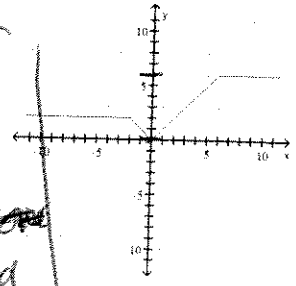
5. Find the domain and range of the function graphed to the right. Write your answer in set-builder notation.

Domain  $\{x | x = \infty\}$

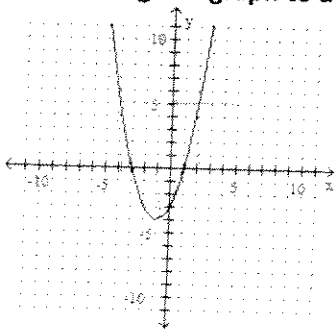
$\{x | x \text{ is a real number}\}$

Range  $\{y | y = 0 \leq 6\}$

$\{y | y \text{ is a real number and } 0 \leq y \leq 6\}$



8. Use the given graph to answer the questions



a) Find  $f(-1)$ . Write your answer as an ordered pair.

$(-1, -4)$

b) Find all x-values such that  $f(x) = 5$

$3, -4$

Names Taran Shaidan, Scotty, Uziel

## 9. Graph each function.

a)  $f(x) = x^2 + 3$

- Vertex: (0, 3)
- Opens up or down up
- Shifted left or right 0 units
- Shifted up or down up 3 units
- Steep, flat, or regular regular

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b)  $h(x) = |x| - 5$

- Vertex: (0, -5)
- Opens up or down up
- Shifted left or right 0 units
- Shifted up or down down 5 units
- Steep, flat, or regular regular

c)  $k(x) = (x - 4)^2 + 1$

- Vertex: (4, 1)
- Opens up or down up
- Shifted left or right right 4 units
- Shifted up or down up 1 units
- Steep, flat, or regular regular

$m(x) = \frac{1}{2}|x - 2| + 3$

- Vertex: (2, 3)
- Opens up or down up
- Shifted left or right right 2 units
- Shifted up or down up 3 units
- Steep, flat, or regular flat

Names Jesse, Joanna Barreira, Devin McFarland

10. Use the given functions to answer the questions that follow

$$f(x) = x^2 - 2 \text{ and } g(x) = 3x + 1$$

a) Find  $(f + g)(x)$ 

$$\begin{aligned} &(x^2 - 2) + (3x + 1) \\ &\hline &x^2 + 3x - 1 \end{aligned}$$

b) Find  $(f - g)(x)$ 

$$\begin{aligned} &(x^2 - 2) - (3x + 1) \\ &\hline &x^2 - 3x - 3 \end{aligned}$$

c) Find  $(f \cdot g)(x)$ 

$$\begin{aligned} &(x^2 - 2)(3x + 1) \\ &\hline &3x^3 + x^2 - 6x - 2 \end{aligned}$$

d) Find  $\left(\frac{f}{g}\right)(x)$ 

$$\begin{aligned} &\frac{x^2 - 2}{3x + 1} \\ &\hline &\frac{x^2 - 1}{3x} \end{aligned}$$

e) Find  $(f \circ g)(x)$ 

$$\begin{aligned} &(3x + 1)^2 - 2 \\ &(3x + 1)(3x + 1) \\ &9x^2 + 3x + 3x + 1 - 2 \\ &\hline &9x^2 + 6x - 1 \end{aligned}$$

Names Katrin, Frank, Andrew

11. Use the given functions to answer the questions that follow.

- $f(x) = 2x - 3$ ,  $g(x) = x + 5$ , and  $h(x) = |x|$
- a) Write the function  $G(x) = 2x + 7$  as a composition of  $f$ ,  $g$ , or  $h$ .

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

Write the function  $K(x) = 2|x| - 3$  as a composition of  $f$ ,  $g$ , or  $h$ .

$$(f \circ h)(x)$$

12. Find  $f(x)$  and  $g(x)$  so that the given function  $h(x) = (f \circ g)(x)$ 

- a)  $h(x) = (x + 3)^2$

$$f(x) = x^2$$

$$g(x) = x + 3$$

- b)  $h(x) = (3x + 4)^2 + 3$

$$f(x) = x^2 + 3$$

$$g(x) = 3x + 4$$

Names Mayra Garcia, Francisco, Ramon

13. Given the values below, find each function value.

$f(-1) = 4$	$g(-1) = -4$
$f(0) = 5$	$g(0) = -3$
$f(2) = 7$	$g(2) = -1$
$f(7) = 1$	$g(7) = 4$

a)  $(f + g)(2) = f(2) + g(2) =$   
 $7 + (-1) = \boxed{6}$

b)  $(f \circ g)(2) = f(g(2))$   
 $f(-1) = \boxed{4}$

c)  $(f \cdot g)(7) = f(7) \cdot g(7)$   
 $1 \cdot 4 = \boxed{4}$

d)  $(g \circ g)(2) = g(g(2))$   
 $g(-1) = \boxed{-4}$

e)  $(f \circ f)(2) = f(f(2))$   
 $f(7) = \boxed{1}$

Names Cam, Crystal

15. Use the properties of exponents to simplify the expression. Write with positive exponents.

a)  $\left(\frac{1}{81}\right)^{1/4}$

$$\frac{1^{1/4}}{81^{1/4}} = \frac{1}{\sqrt[4]{81}} = \frac{1}{3}$$

b)  $a^{-1/4}(a^{5/4} - a^{9/4})$

$$a^{-1/4}a^{5/4} - a^{-1/4}a^{9/4}$$

$$a^{4/4} - a^{8/4}$$

$$= a - a^2$$

$$c) \frac{x^{1/4}x^{-1/2}}{x^{1/4}} = \frac{x^{1/4}x^{-2/4}}{x^{1/4}} = \frac{x^{-1/4}}{x^{1/4}} = x^{-3/4} = \frac{1}{x^{3/4}}$$

$$\frac{5(2x^{-2/3})^2}{x^{-2/5}} = \frac{5 \cdot 2^2 \cdot (x^{-2/3})^2}{x^{-2/5}} = \frac{20 \cdot (x^{-2/3})^2}{x^{-2/5}} = \frac{20 \cdot x^{-4/3}}{x^{-2/5}} = \frac{20 \cdot x^{-20/15}}{x^{-6/15}} = 20x^{-14/15} = \frac{20}{x^{14/15}}$$

Names Ahmed Shehadeh, Arhette Santos

16. Use radical notation to write the expression. Then simplify your answer.

a)  $y^{\frac{5}{4}}$

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

Radical Notation	Simplified
$\sqrt[4]{y^5}$	$y^{\frac{5}{4}}$

b)  $(x + 2y)^{-\frac{1}{2}}$

$$\frac{1}{\sqrt{x+2y}} = (x+2y)^{-\frac{1}{2}}$$

Radical Notation	Simplified
$\frac{1}{\sqrt{x+2y}}$	$(x+2y)^{-\frac{1}{2}}$

c)  $5(xy^2z^5)^{\frac{1}{3}}$

$$5\sqrt[3]{xy^2z^5}$$

$$5z\sqrt[3]{xy^2}$$

Radical Notation	Simplified
$5\sqrt[3]{xy^2z^5}$	$5z\sqrt[3]{xy^2}$

~~(-8)^4~~  $(-8)^{\frac{4}{3}}$

$$\sqrt[3]{(-8)^4}$$

$$(-8)^4 = +4096$$

$$\sqrt[3]{+4096} = +16$$

Radical Notation	Simplified
$\sqrt[3]{(-8)^4}$	$+16$

need parentheses!

Names

[Redacted] Adams + Zandy (Alexandra) Sexton

17. Multiply

$x^{1/5}(x^{1/5} - 3)$

$$= x^{1/5} (x^{1/5} - 3)$$

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

10.2

18. Factor the common factor from the given expression

$x^{-1/3}; (5x^{-1/3} + x^{2/3})$

$$\text{GCF} = x^{-1/3}$$

$$= x^{-1/3} (5 + x^{3/3})$$

$$= x^{-1/3} (5 + x)$$

Names Mania, Leslie Solorzano

20. Use rational expressions to write as a single radical expression.

a)  $\sqrt[3]{y} \cdot \sqrt[5]{y^2}$

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

$$y^{5/15} y^{6/15}$$

$$y^{5/15+6/15}$$

$$y^{11/15} = \sqrt[15]{y^{11}}$$

$$\frac{1}{3} \cdot \frac{2}{5} = \frac{2}{15}$$

$$\frac{2}{5} \cdot \frac{3}{3} = \frac{6}{15}$$

b)  $\frac{\sqrt[5]{b^2}}{\sqrt[10]{b^3}}$

$$\frac{b^{2/5}}{b^{3/10}} = \frac{b^{4/10}}{b^{3/10}} = b^{4/10-3/10}$$

$$= b^{1/10} = \sqrt[10]{b}$$

$$\frac{a^4}{a^2} = \frac{a \cdot a \cdot a \cdot a}{a \cdot a} = a^2$$

$$\frac{a^4}{a^2} = a^{4-2} = a^2$$

$\sqrt[3]{5} \cdot \sqrt[5]{y^2}$

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

$$5^{5/15} y^{6/15}$$

$$(5^5 y^6)^{1/15}$$

$$= \sqrt[15]{5^5 y^6}$$

$$= \sqrt[15]{3125 y^6}$$