

1. Find the equation of the circle with center $(-1, 9)$ and radius $\sqrt{3}$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+1)^2 + (y-9)^2 = (\sqrt{3})^2$$

$$x^2 + 2x + 1 + y^2 - 18y + 81 = 3$$

$$x^2 + 2x + y^2 - 18y = -79$$

2. Simplify

$$\frac{\frac{x^2-y^2}{2x} \cdot 2x^2}{\frac{x+y}{x^2} \cdot 2x^2}$$

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

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

$$= \frac{x(x-y)}{2}$$

Multiply top & bottom by $2x^2$ to clear fractions:

3. Given $f(x) = x - 3$ and $g(x) = \sqrt{x-2}$

Find the domain of the quotient function f/g .

$$\frac{f}{g} = \frac{x-3}{\sqrt{x-2}}$$

$$x-2 > 0$$

$$\text{Domain } x > 2$$

Domain is all x greater than 2.

(Can't \div by zero & sq. roots have to be positive)

4. Write an equation for a function that has the shape of

$$y = x^3$$

But is shifted right 4 units and up one unit.

$$\rightarrow 4 \text{ units means } (x-4)^3$$

$$\uparrow 1 \text{ unit means add 1 to function } (x-4)^3 + 1$$

$$\Rightarrow \text{New function } y = (x-4)^3 + 1$$

5. Find the difference quotient $\frac{f(x+h)-f(x)}{h}$ for $2-x^2$ 14. _____

$$-(2-x^2) = -2+x^2$$

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

$$f(x+h) = 2 - (x+h)^2 = 2 - (x^2 + 2xh + h^2) = 2 - x^2 - 2xh - h^2$$

Diff Quotient: $\frac{f(x+h)-f(x)}{h} = \frac{2 - x^2 - 2xh - h^2 - 2 + x^2}{h} = \frac{-2xh - h^2}{h} = \boxed{-2x - h}$

6. Determine whether the graph of $y=|4x|$ is symmetric with respect to the x-axis, the y-axis, or the origin

