

NO CALCULATOR – Leave all answers in exact form.

1. Find the x - and y -intercepts for the graphs of the following equation.

$$y^2 - 3 = x$$

2. Graph the following equation. Find any intercepts.

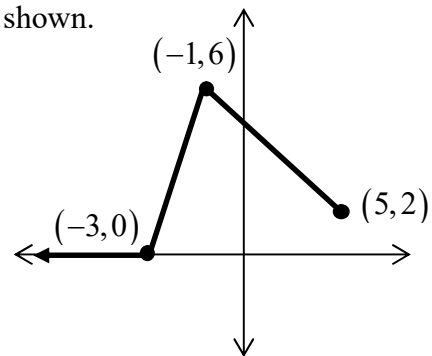
$$x = \sqrt{y+2}$$

3. Find the domain and range of the following functions.

a. $y = \sqrt{x-1}$

b. $f(x) = \frac{x-2}{x+4}$

4. Give the rule of a function defined piecewise for the graph shown.



5. The difference quotient of a function $y = f(x)$ is: $\frac{f(x+h) - f(x)}{h}$ $h \neq 0$

Find the difference quotient of the function f defined by:

$$f(x) = 2x^2 - x + 1$$

Simplify:

6. $(32^{3/2})\left(\frac{1}{2}\right)^{3/2}$

7. $(9^{2/3})(3)(3)^{2/3}$

8. $\ln e^{x^2}$

9. $\ln e^{2x-1}$

10. $e^{\ln(5x+2)}$

For #11 – 12, no guess and check.

11. Algebraically solve for x :

$$\left(\frac{1}{5}\right)^{2x} = 625$$

12. Algebraically solve for x .

$$\log_3 x + \log_3 (x-1) = \log_3 6$$

Use the properties of logarithms to write the expression as a sum, difference, or multiple of logarithms.

13. $\ln \frac{3x(x+1)}{(2x+1)^2}$

14. If plutonium decays according to $y = 100e^{-.000028t}$, where t is measured in years, what is the half-life if we start with 100 grams of plutonium?
(Leave answer in EXACT FORM – no calculator!)