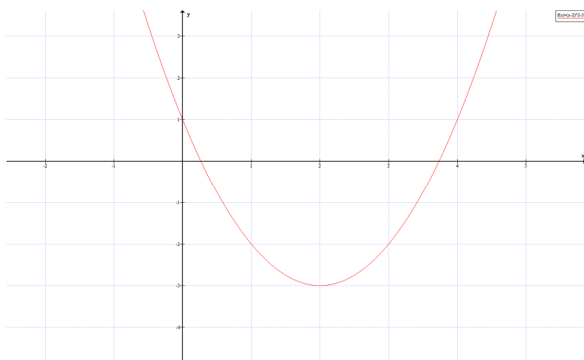


### Practice Problems for VPT Calculus Part I (No Trig)

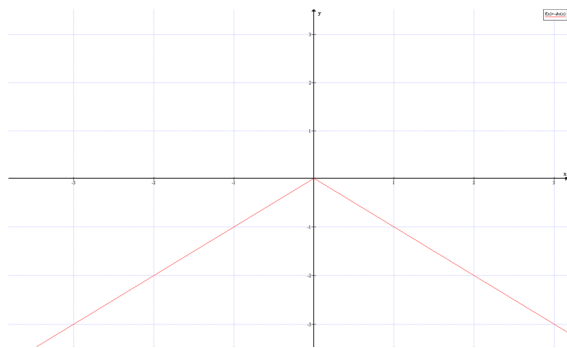
1. Write the domain of  $f(x) = \sqrt{x+2}$  in interval notation.
2. Write the domain of  $f(x) = \sqrt{x} - 4$  in interval notation.
3. Find and simplify  $f \circ g(x)$  if  $f(x) = x^2 + 2x - 3$  and  $g(x) = x + 1$ .
4. Find and simplify  $f \circ g(x)$  if  $f(x) = \frac{1}{x+2}$  and  $g(x) = \frac{3}{x-1}$ .
5. Simplify  $(a^3b)^2(ab^4)$ .
6. Simplify  $\left(\frac{a^2b^2}{ab^3}\right)^{-2}$ .

For #7-11, write the function notation for each function that is graphed below.

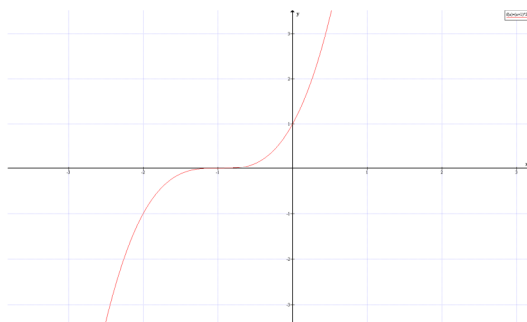
7.



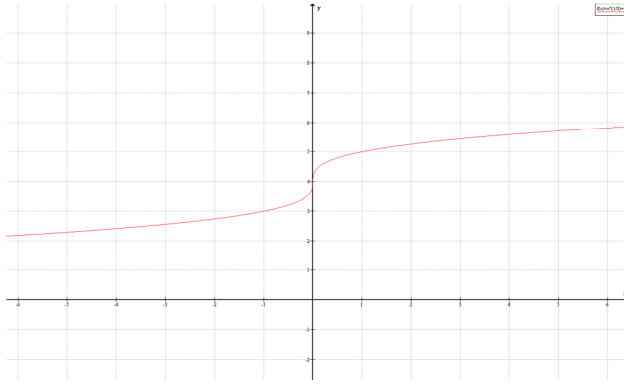
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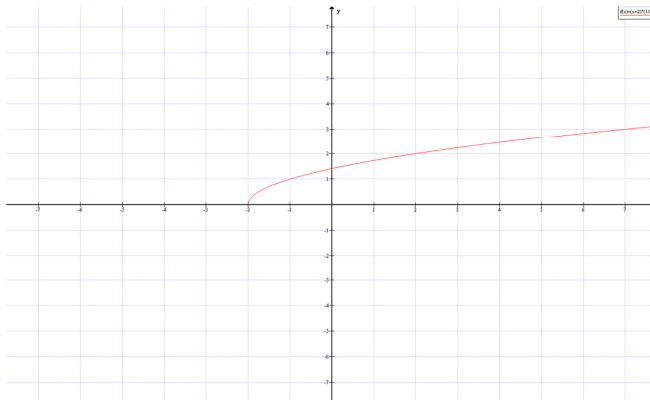
9.



10.



11.



12. Given  $f(x) = 4x + 2$ , find  $f^{-1}(x)$ .

13. Given  $f(x) = \frac{3}{2-x}$ , find  $f^{-1}(x)$ .

14. Graph  $f(x) = \begin{cases} -2x & \text{if } x < 1 \\ x-5 & \text{if } x \geq 1 \end{cases}$

15. Graph  $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 5 & \text{if } x = 0 \\ x+2 & \text{if } x > 0 \end{cases}$

$$f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 5 & \text{if } x = 0 \\ x+2 & \text{if } x > 0 \end{cases}$$

For Problems 16-18,  $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 5 & \text{if } x = 0 \\ x+2 & \text{if } x > 0 \end{cases}$

16. Find  $f(-3)$ .

17. Find  $f(0)$ .

18. Find  $f(4)$ .

19. Given  $f(x) = x^2 + 3x - 4$ , find and simplify the Difference Quotient  $\frac{f(x+h) - f(x)}{h}$ .

20. Given  $f(x) = 2x^2 - 3x + 7$ , find and simplify the Difference Quotient  $\frac{f(x+h) - f(x)}{h}$ .

21. Rationalize the denominator of  $\frac{\sqrt{z} + 3}{\sqrt{z} - 3}$ .

22. Rationalize the denominator of  $\frac{x}{\sqrt{x} + 4}$ .

23. Write as a single logarithm:  $\ln x + 2\ln(x+2) - 4\ln(x-3)$

24. Write as a single logarithm:  $2\ln 3 - \ln(6^2 - 4)$

25. Write using exponents:  $(\sqrt[3]{x})^4$

26. Write in exponential form:  $\ln 2 = x$

27. Write in exponential form:  $\log_a 7 = 2$

### Answers to Practice Problems for VPT Calculus Part I (No Trig)

1.  $D = [-2, \infty)$

2.  $D = [0, \infty)$

3.  $f \circ g(x) = x^2 + 4x$

4.  $f \circ g(x) = \frac{x-1}{2x+1}$

5.  $a^7 b^6$

6.  $\frac{b^2}{a^2}$

7.  $f(x) = (x-2)^2 - 3$

8.  $f(x) = -|x|$

9.  $f(x) = (x+1)^3$

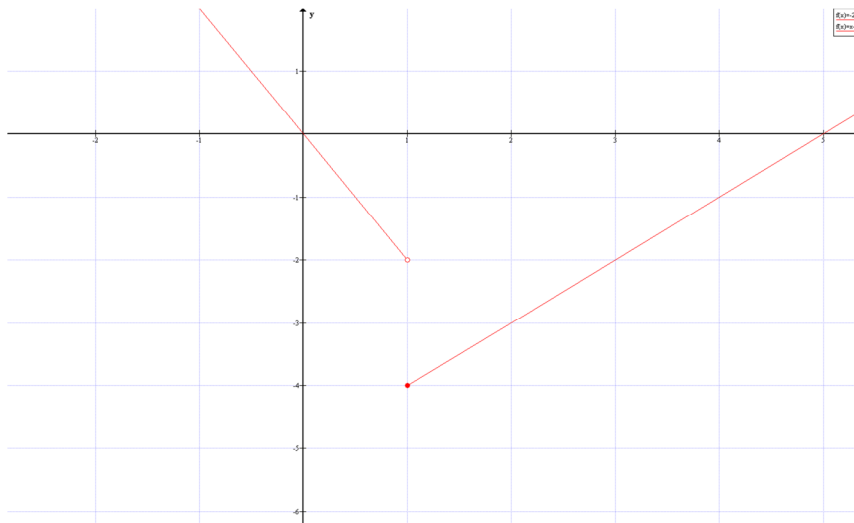
10.  $f(x) = \sqrt[3]{x} + 4$

11.  $f(x) = \sqrt{x} + 2$

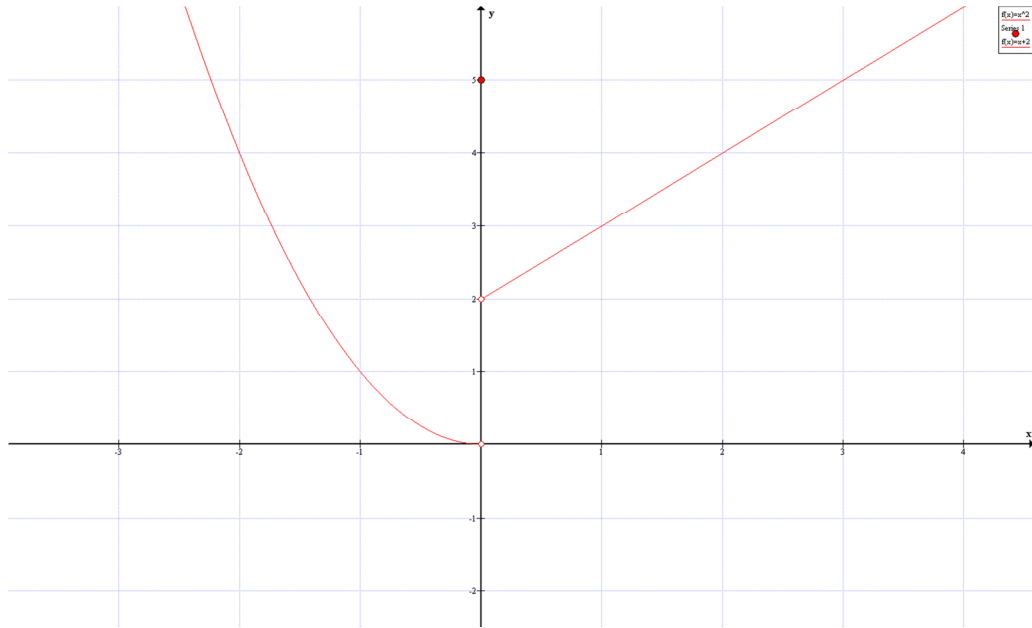
12.  $f^{-1}(x) = \frac{x-2}{4}$

13.  $f^{-1}(x) = \frac{3-2x}{-x} = \frac{2x-3}{x}$

14.



15.



16.  $f(-3)=9$

17.  $f(0)=5$

18.  $f(4)=6$

19.  $2x+h+3$

20.  $4x+2h-3$

21. 
$$\frac{z+6\sqrt{z}+9}{z-9}$$

22. 
$$\frac{x(\sqrt{x}-4)}{x-16}$$

23. 
$$\ln\left(\frac{x(x+2)^2}{(x-3)^4}\right)$$

24. 
$$\ln\left(\frac{9}{32}\right)$$

25.  $x^{\frac{4}{3}}$

26.  $e^x = 2$

27.  $a^2 = 7$