

You must show all your work to receive credit. Simplify your answers.

1.] (2 pts) Compute $f(3)$ and $f(2)$ if $f(t) = (7-2t)^{-5/2}$

$$f(3) = (7-2 \cdot 3)^{-5/2} = 1^{-5/2} = 1.$$

$$f(2) = (7-2 \cdot 2)^{-5/2} = 3^{-5/2} = \frac{1}{3^{5/2}} = \frac{1}{3^{4/2} \cdot 3^{1/2}} = \frac{1}{3^2 \sqrt{3}} = \frac{1}{9\sqrt{3}}.$$

2.] (2 pts) Find the domain of the function

$f(x)$ is undefined when

$$x+2 < 0 \quad \text{or} \quad x^2-1 = 0$$

$$x < -2 \quad (x+1)(x-1) = 0$$

$$x = 1, x = -1$$

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

The domain is all reals $x \geq -2$ except 1 and -1.

3.] (2 pts) For $f(x) = 3 - 2x$, find the difference quotient of f :

$$\frac{f(x+h) - f(x)}{h} = \frac{[3-2(x+h)] - (3-2x)}{h}$$

$$= \frac{[3-2x-2h] - 3 + 2x}{h} = \frac{3-3-2x+2x-2h}{h} = \frac{-2h}{h} = -2.$$

4.] (2 pts) Sketch the graph of the function; include any intercepts or vertices, if they exist.

x-int: $7-x=0$
 $x=7$ (7,0)

and $-x^2-2x+3=0$
 $x^2+2x-3=0$
 $(x+3)(x-1)=0$
 $x=-3, x=1$
(-3,0) (1,0)

$$f(x) = \begin{cases} \text{Opens Down} \\ -x^2 - 2x + 3 & \text{if } x \leq 1 \\ 7 - x & \text{if } x > 1 \end{cases}$$

Vertex: $x_v = \frac{-B}{2A}$

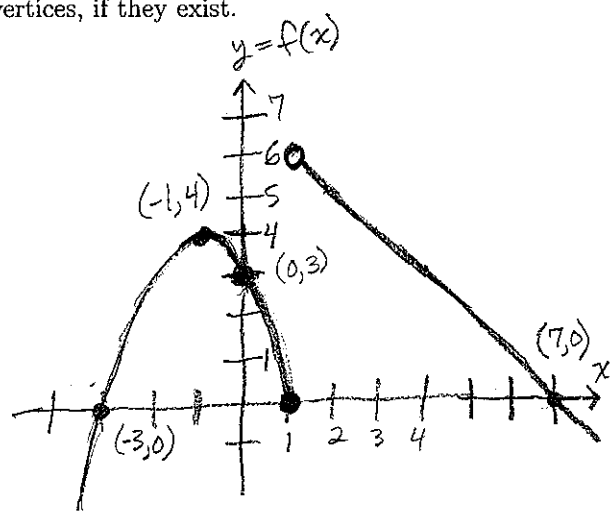
$$= \frac{-(-2)}{2(-1)}$$

$$= -1.$$

$$y_v = f(-1) = -1 + 2 + 3 = 4$$

(-1,4)

y-int: $x=0 \Rightarrow f(x) = -x^2 - 2x + 3$
 $f(0) = 3$ (0,3)



5.] (2 pts) Find an equation for the line through (1,2) and parallel to the line $2y + 8x = 0$.

$$y - y_1 = m(x - x_1)$$

$$y - 2 = -4(x - 1)$$

$$y - 2 = -4x + 4$$

$y = -4x + 6$

same slope

$$2y = -8x \quad y = mx + b$$

$$y = -4x \Rightarrow m = -4$$