Name: *Caleb McWhorter — Solutions*
MATH 111-I
Spring 2025
Quiz 2

Problem 1: Suppose an item that costs p dollars is discounted by 30%. Find an expression that gives the discounted cost of the item.

We know if a number N is increased/decreased by a percentage %, the result is given by $N(1 \pm \%_d)$, where '$+$' is chosen for a percentage increase, '$-$' is chosen for a percentage decrease, and $\%_d$ is the percentage expressed as a decimal. Therefore, the expression that gives the discounted cost of the item is...

$$p(1 - \%_d)$$
$$p(1 - 0.30)$$
$$0.70p$$

We know $0.70p$ represents 70% of the number p—the cost remaining after discounting it by 30%.

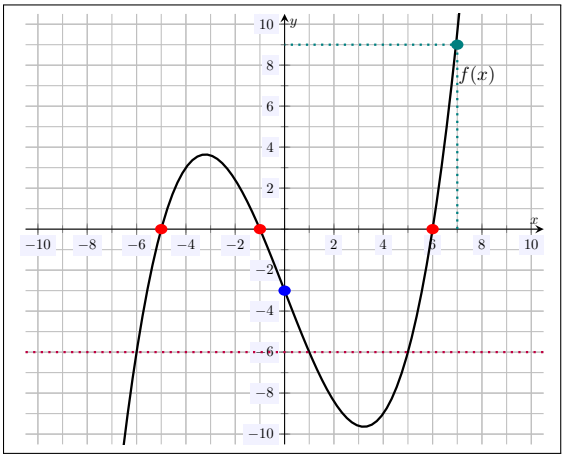
Problem 2: Is $x = -2$ a solution to the equation $\dfrac{2x-1}{x+1} = x^2 + 1$? Explain.

We check whether $x = -2$ is a solution to the given equation by evaluating each side of the equality at $x = -2$ and seeing if we obtain the same result:

$$\frac{2x-1}{x+1} = x^2 + 1$$
$$\frac{2(-2)-1}{-2+1} \stackrel{?}{=} (-2)^2 + 1$$
$$\frac{-4-1}{-1} \stackrel{?}{=} 4 + 1$$
$$\frac{-5}{-1} \stackrel{?}{=} 5$$
$$5 = 5$$

Therefore, $x = -2$ is a solution to the given equation.

Problem 3: Consider the function $f(x)$ plotted below.



(a) Find the x-intercepts.

$x = -5, -1, 6$

(b) Find the y-intercepts.

$y = -3$

(c) What is $f(7)$?

$f(7) = 9$

(d) Solve the equation $f(x) = -6$.

$x = -6, 1, 5$