Math-1003b Homework #11 Solutions

Reading

- Section 10.1

Problems

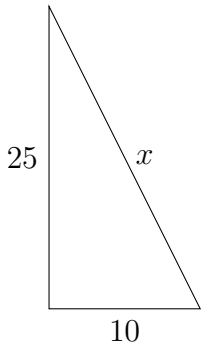
1). Simplify:

$$\sqrt[3]{\frac{64x^3y^6}{z^{12}}} = \sqrt[3]{\frac{4^3x^3(y^2)^3}{(z^4)^3}} = \sqrt[3]{\left(\frac{4xy^2}{z^4}\right)^3} = \frac{4xy^2}{z^4}$$

2). Simplify:

$$\sqrt[4]{\frac{16x^4y^8}{z^{12}}} = \sqrt[4]{\frac{2^4x^4(y^2)^4}{(z^3)^4}} = \sqrt[4]{\left(\frac{2xy^2}{z^3}\right)^4} = \frac{2\left|x\right|y^2}{\left|z\right|^3}$$

3). You are standing 10 feet away from a 25 foot flagpole. How far away are you from the flag at the top of the pole?



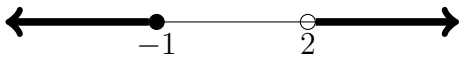
$$x^2 = 10^2 + 25^2$$
$$x^2 = 100 + 625$$
$$x^2 = 725$$
$$x = \sqrt{725} = 26.9$$
26.9 feet

4). Find the domain:

a). $f(x) = \sqrt[4]{\frac{x+1}{x-2}}$

This is an even root so that radicand cannot be negative:

$\frac{x+1}{x-2} \geq 0$



$x \in (-\infty, -1] \cup (2, \infty)$

b). $f(x) = \sqrt[3]{\frac{x+1}{x-2}}$

This is an odd root so we don't need to worry about the radicand being negative; however, we do still worry about the pole at $x = 2$:

$x \in (-\infty, 2) \cup (2, \infty)$