Name _____ Date _____

LESSON 5.6

Real-Life Application: When Will I Ever Use This?

For use with the lesson "Solve Absolute Value Inequalities"

Compact Disc (CD) Players

Many high school students listen to CDs and own CD players. CDs hold both music and other information for computers. The information and music is stored on CDs with a series of very small bumps in a long continuous spiral. The CD player needs to find and read back the data or bumps stored on the CD. The basic parts are a drive motor to spin the disc, a laser and a lens, and a tracking mechanism. The player must be precisely calibrated or it will not be able to read the disc. The CD player must focus the laser on the track of bumps. The beam is bounced back to the lens. The bumps will reflect light one way while the smooth parts reflect another. This is the way the CD player interprets the bits into bytes and from there to you as music or information.

One of the most difficult tasks is keeping the laser and lens focused. The player does this by using an autofocus signal based on the information that is being fed back to it.

In Exercises 1 and 2, use the following information.

A bump on a CD needs to be between 0.45 and 0.55 micron wide and between 0.95 and 0.99 micron high.

1. Write two absolute value inequalities describing the width and the height of the bump respectively.

2. Graph the inequalities.

In Exercises 3 and 4, use the following information.

A CD can store between 73.9 and 74.1 minutes of music before it is considered full.

3. Write an absolute value inequality describing the minutes of data a full CD will hold.

4. Graph the inequalities from Exercise 3.

5. The plating of gold on a CD player part measures 0.56 micron thick. Does this fall within the required standards if a company uses $|x - 0.03| \leq 0.525$ for determining an acceptable part?

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