Algebra 2 w/ Trig

4.6 Solve Exponential and Logarithmic Equations

Warm-Up:

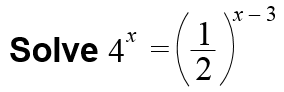
1. **Write log**3(2*x* – 7) = 4 **in exponential form. 2. Write** 8*x* = 30 **in logarithmic form.**

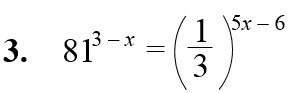
**Solve the equation.**

**3. 100*x* = 1000 4.** **log**5*x* = –3

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Example 1: Solve by Equating Exponents YOU TRY: **Solve the equation.**





Example 2: Take a Logarithm of Each Side



Example 3: Use an exponential Model

**You are driving on a hot day when your car overheats and stops running. It overheats at** 280°F **and can be driven again at** 230°F**. If** *r* = 0.0048 **and it is** 80°F **outside, how long (in minutes) do you have to wait until you can continue driving?**

Newton’s Law of Cooling:

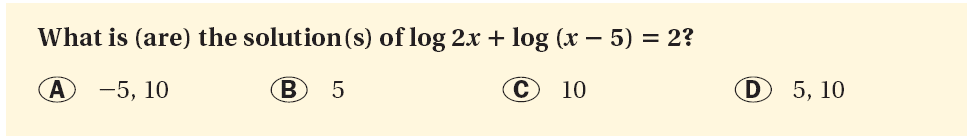
YOU TRY: **Solve the equation.**



Example 4: Solve a Logarithmic Equation Example 5: Exponentiate Each Side of an Equation

Example 6: Multiple Choice!!!

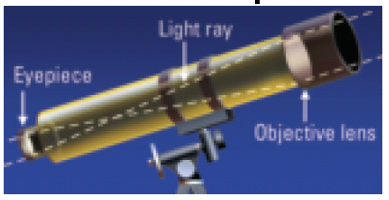


YOU TRY: **Solve the equation. Check for extraneous solutions.**

Example 7: Use a Logarithmic Model

**The *apparent magnitude* of a star is a measure of the brightness of the star as it appears to observers on Earth. The apparent magnitude** *M***of the dimmest star that can be seen with a telescope is given by the function**

*M* = 5 **log** *D* + 2

**where** *D***is the diameter (in millimeters) of the telescope’s objective lens. If a telescope can reveal stars with a magnitude of** 12**, what is the diameter of its objective lens?**

YOU TRY:

**WHAT IF? Use the information from Example 7 to find the diameter of the objective lens of a telescope that can reveal stars with a magnitude of** 7**.**

KEEP GOING:

**Solve the equation.**



Hw: Section 4.6 p. 271 #25-45 odd