Algebra 2 w/ Trig

1.9 Graph and Solve Quadratic Inequalities

Warm- Up:

**1. Solve** *x*2 – 2*x* – 24 = 0**.** **2. Solve** –8 < 3*x* –5 < 7**.**

**3. A point on a graph moves so that the function**

*y*= 2*x*2 –3*x* **–** 20 **describes how the vertical**

**position** y **is related to the horizontal position** *x***.**

**What is the vertical position when the horizontal**

**position is –**3**?**

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*y*

*x*

Example 1: Graph a Quadratic Inequality

**Graph** *y* > *x*2 + 3*x* – 4.

Example 2: Use a Quadratic Inequality in Real Life

**A manila rope used for rappelling down a cliff can safely support a weight** *W***(in pounds) provided**

*W* ≤ 1480*d*2 **where** *d***is the rope’s diameter (in inches). Graph the inequality.**



Example 3: Graph a System of Quadratic Inequalities

*y*

*x*

**Graph the system of quadratic inequalities.**

*y* < – *x*2 + 4

*y* > *x*2 – 2*x* – 3

YOU TRY:

**Graph the inequality.**

1. *y* > *x*2 + 2*x* – 8 2. *y* < 2*x*2 – 3*x* + 1 3. *y* < – *x*2 + 4*x* + 2

*y*

*x*

*y*

*x*

*y*

*x*

**4. Graph the system of inequalities consisting of** *y* ≥ *x*2 **and** *y* < 2*x*2 + 5**.**

*y*

*x*

Example 4: Solve a Quadratic Inequality Using a Table Example 5: Solve a Quadratic inequality by Graphing

**Solve** *x*2 + *x* ≤ 6 **using a table. Solve 2*x*2 + *x* – 4 ≥ 0 by graphing.**

*y*

*x*

YOU TRY:

**5. Solve the inequality** 2*x*2 + 2*x* ≤ 3 **using a table and using a graph.**

*y*

*x*

Example 6: Use a Quadratic Inequality as a Model

**The number** *T***of teams that have participated in a robot-building competition for high school students can be modeled by**

*T*(*x*) = 7.51*x*2 –16.4*x* + 35.0, 0 ≤ *x* ≤ 9

**Where *x* is the number of years since 1992. For what years was the number of teams greater than 100?**



Example 7: Solve a Quadratic Inequality Algebraically

Hw: Section 1.9 p. 70 #21-35 odd

**Solve** *x*2 – 2*x* > 15 **algebraically.**

YOU TRY:

**6. Use the information in Example** 6 **to determine in what years at least** 200 **teams participated in the robot-building competition.**

**7. Solve the inequality 2*x*2 – 7*x =* 4 algebraically.**

KEEP GOING:

**1.** **Solve** 3*x*2 + 2*x* – 1 < 0 **by graphing. 2. Graph *y* 2*x*2 – 4 and *y <* – x2 + 3 as a system of**

 **inequalities.**

*y*

*x*

*y*

*x*

**Solve** **the inequalities.**

**3.** *x*2 + 4*x* < 5 **4.** 2*x*2 + *x* – 15 > 0