

## Teacher Resource 5.4 Castle Targets

### Directions

If your catapult trajectory achieves a parabolic path within a range of 10–15 feet, Castle Targets will allow you to find the dimensions of the targets shown on **Student Resource 4.4: Analyze the Catapult—Part 2**. In addition, it gives you a mathematical strategy for assigning relative target point values for playing the game. The diagram on the back can be used to determine the total area of the castle.

Fill in the table to find target dimensions and establish point values.

| Target       | Area,<br>(Factored<br>Form) | Dimensions<br>if $x = 2$ | Area       | Percent of<br>Total<br>Target<br>Area | Rank, 1<br>=<br>Largest | Reciprocal<br>of %,<br>Rounded | Point<br>Value |
|--------------|-----------------------------|--------------------------|------------|---------------------------------------|-------------------------|--------------------------------|----------------|
| A            | $(x+1)(x+10)$               | $3*12$                   | 36         | 11.4                                  | 4                       | 9                              |                |
| B            | $(12-x)(x+4)$               | $10*6$                   | 60         | 19.0                                  | 2                       | 5                              |                |
| C            | $(2x+1)(3x)$                | $5*6$                    | 30         | 9.5                                   | 5                       | 11                             |                |
| D            | $(x+5)(x+4)$                | $7*6$                    | 42         | 13.3                                  | 3                       | 8                              |                |
| E            | $(9-x)(8-x)$                | $7*6$                    | 42         | 13.3                                  | 3                       | 8                              |                |
| F            | $(2x+3)(2x+2)$              | $7*6$                    | 42         | 13.3                                  | 3                       | 8                              |                |
| G            | $(19x+1)(x+1)$              | $21*3$                   | 63         | 20.0                                  | 1                       | 5                              |                |
| <b>Total</b> |                             |                          | <b>315</b> |                                       |                         |                                |                |