

A theatre holds **at most 850** people and a group is planning a benefit concert in hopes of raising **at least \$12,600** for the Cancer Society.

Tickets will cost \$18.00 for Adults and \$12.00 for Students.

| Adults |   | Students | Total      |
|--------|---|----------|------------|
| 7      | + | 24       | = 31       |
| 220    | + | 100      | = 320      |
| A      | + | S        | $\leq 850$ |

<sup>\$18</sup>  
Adults  
7

<sup>\$12</sup>  
Students  
24

Total  
money

$$18(7)$$

$$126$$

+

$$12(24)$$

$$288$$

$$= 414$$

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$$220$$

---

$$100$$

$$18(220)$$

$$3960$$

+

$$12(100)$$

$$1200$$

$$= \$5160$$

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A

S

$$18(A)$$

+

$$12(S)$$

$$\cong 12600$$

$$A + S \leq 850$$

|       |       |                  |
|-------|-------|------------------|
| $x$   | $y$   | $0 + 0 \leq 850$ |
| $A$   | $S$   | $0 \leq 850$     |
| $0$   | $850$ | $T$              |
| $850$ | $0$   |                  |

$$0 + S \leq 850$$

$$S \leq 850$$

$$A + 0 \leq 850$$

$$A \leq 850$$

$$18A + 12S \geq 12600$$

|       |        |                    |
|-------|--------|--------------------|
| $A$   | $S$    | $0 + 0 \geq 12600$ |
| $0$   | $1050$ | $0 \geq 12600$     |
| $700$ | $0$    | $F$                |

$$18(0) + 12S \geq 12600$$

$$\frac{12S}{12} \geq \frac{12600}{12}$$

$$S \geq 1050$$

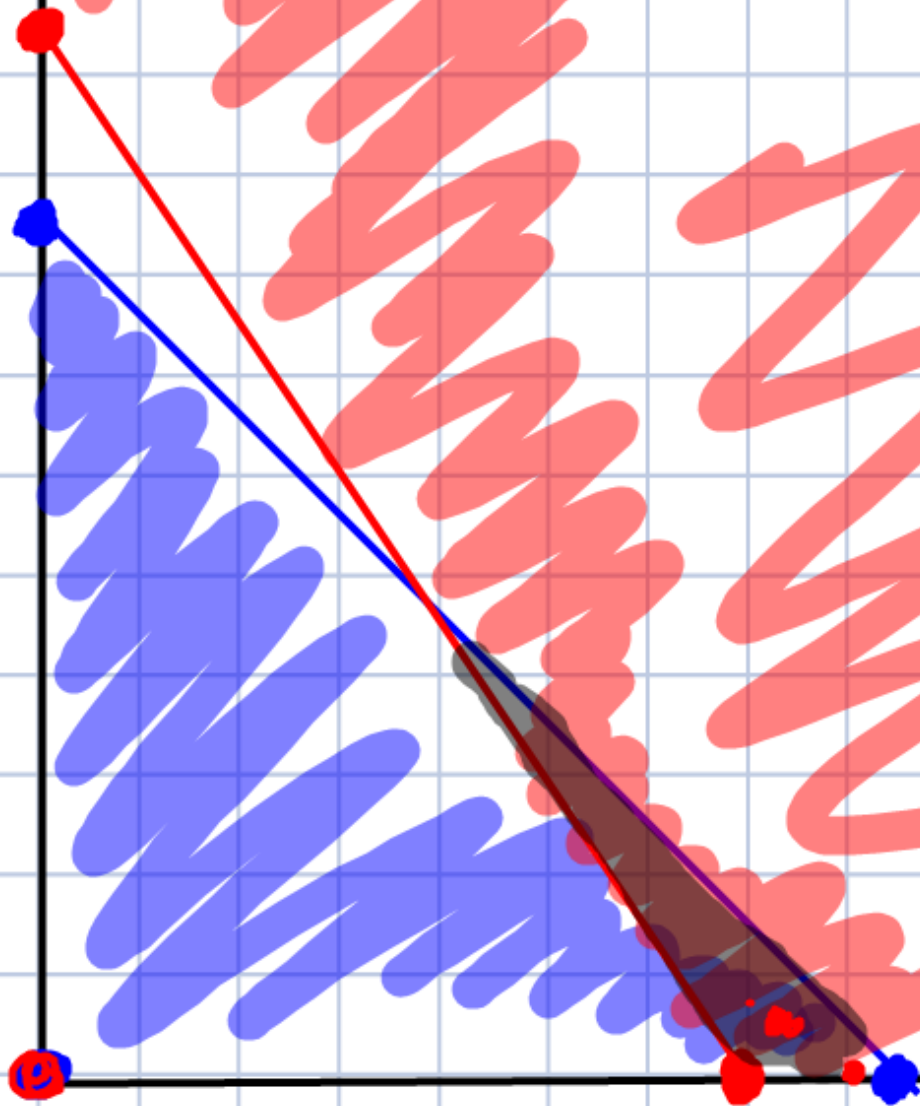
$$18A + 12(0) \geq 12600$$

$$\frac{18A}{18} \geq \frac{12600}{18}$$

$$A \geq 700$$

Students

701, 50  
800, 0  
800, 2



Adult

## 3 Formats

Standard Form

$$y = ax^2 + bx + c$$

Intercept Form

$$y = a(x - p)(x - q)$$

Vertex Form

$$y = a(x - h)^2 + k$$

$$y = (x + 3)(x + 5) \quad \text{Intercept Form}$$
$$y = a(x - p)(x - q)$$

$$p = -3 \quad q = -5$$

$$\begin{array}{c} \text{x-Int} \\ (-3, 0) (-5, 0) \end{array}$$

$$\text{Axis} \rightarrow x = \frac{p+q}{2} = \frac{-3 + -5}{2} = \frac{-8}{2} = -4$$
$$x = -4$$

$$\text{Vertex } x = -4$$

$$y = (-4 + 3)(-4 + 5)$$

$$y = (-1)(1) = -1$$

$$y = -1$$

$$(-4, -1)$$

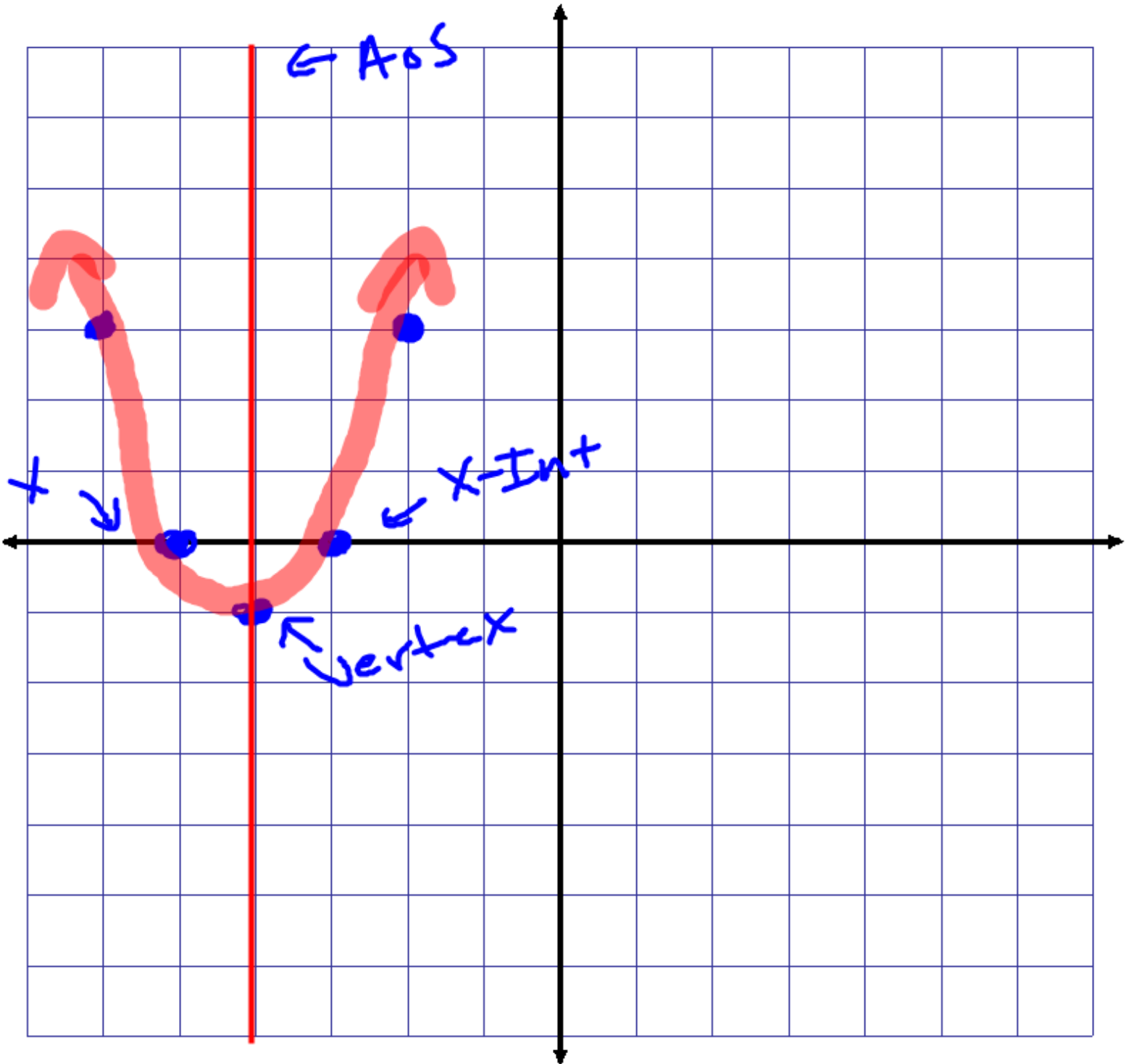
$$x = -2$$

$$y = (-2 + 3)(-2 + 5)$$

$$= (1)(3)$$

$$y = 3$$

$$(-2, 3)$$



$$y = (x + 3)^2 - 4$$

$$h = -3 \quad k = -4$$

Vertex  $(-3, -4)$

$$\text{AoS} \rightarrow x = -3$$

$$x = -2$$

$$y = (-2 + 3)^2 - 4$$

$$y = (1)^2 - 4$$

$$y = 1 - 4 = -3$$

$$(-2, -3)$$

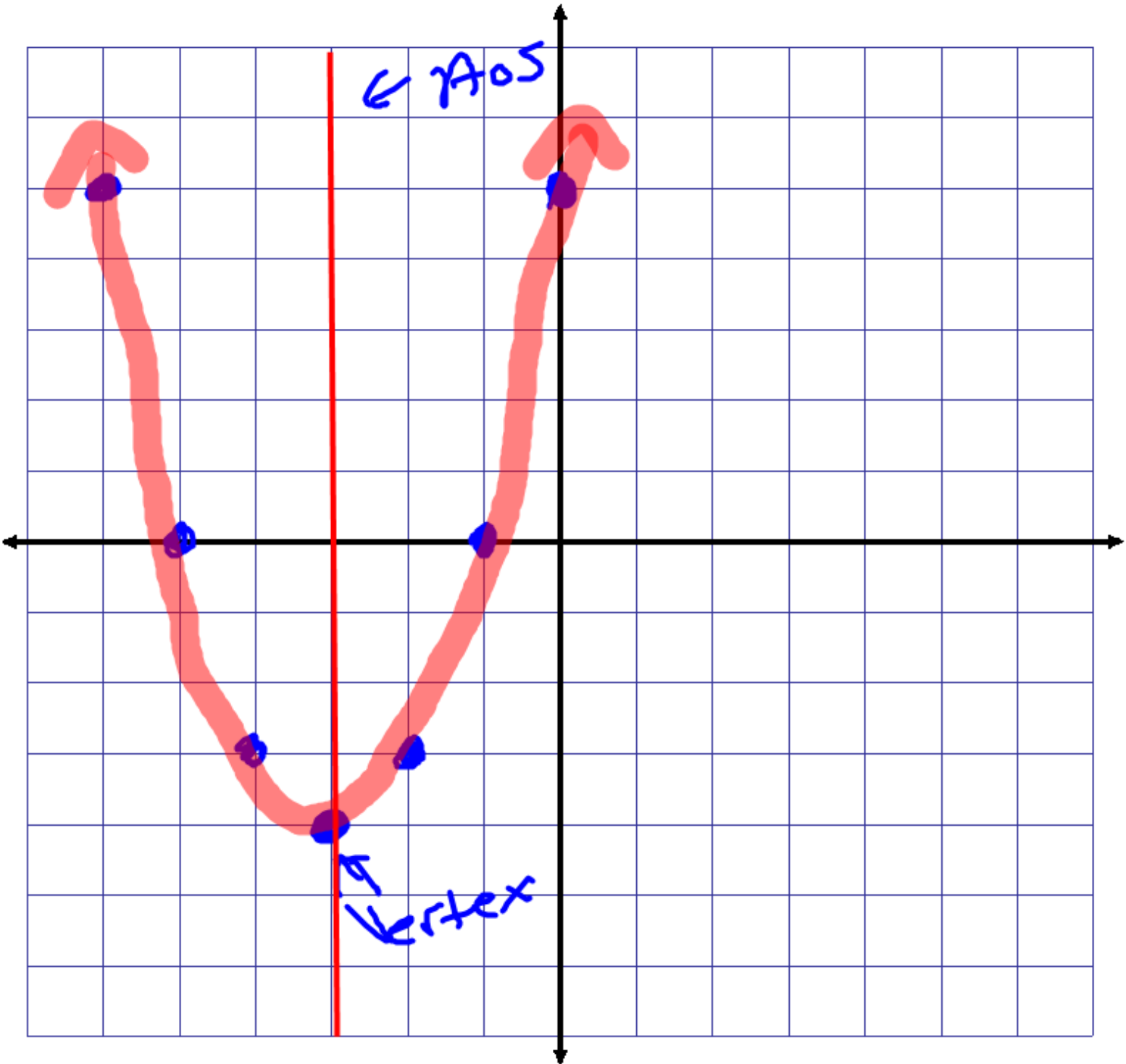
$$x = -1$$

$$y = (-1 + 3)^2 - 4$$

$$y = (2)^2 - 4$$

$$y = 4 - 4 = 0$$

$$y = 0 \quad (-1, 0)$$



(8 points total) An object begins at ground level and is projected into the air with a path described by the quadratic function  $h = -16t^2 + 32t$  where  $h$  is the height above the ground (in feet) and  $t$  is the time (in seconds) since the object started along the path. (Total of 8 points)

$$h = -16T^2 + 32T$$

$$h = -16T(T - 2)$$

$$\frac{-16T}{-16} = \frac{0}{-16} \quad T - 2 = 0$$

$$T = 0 \quad \frac{+2 + 2}{T = 2}$$

$$h = -16(1)^2 + 32(1)$$

$$= -16(1) + 32(1)$$

$$= -16 + 32$$

$$h = 16 \text{ ft}$$

$$\frac{-16T^2}{+16T} \quad \frac{32T}{-16T}$$

$$a = -16 \quad b = 32 \quad c = 0$$

$$\text{Ans } T = \frac{-b}{2a}$$

$$= \frac{-(32)}{2(-16)} = \frac{-32}{-32}$$

$$T = 1$$