1. Carmen is starting a job as salesperson at a jewelry store. The jewelry store offers her two salary plans. One plan includes a monthly base pay of $300 plus 10% commission on her sales. The second plan is a monthly salary of $1200. What must the amount of sales be for Carmen to make more money with the first plan?

Inequality $300 + 0.10s > 1200$

$0.10s$ represents 10% of the sales and this term is added to Carmen's $300 base pay. This expression must be greater than $1200.

|	
$300 + 0.10s > 1200$	original inequality
$-300 \qquad -300$	subtract 300 from both sides of the inequality
$0.10s > 900$ $$\frac{0.10}{0.10}s > \frac{900}{0.10}$$	divide both sides of the inequality by 0.10
$s > 9000$	Solution

Graph

Carmen will need to sell more than $9000 worth of jewelry to make more money with the first plan.

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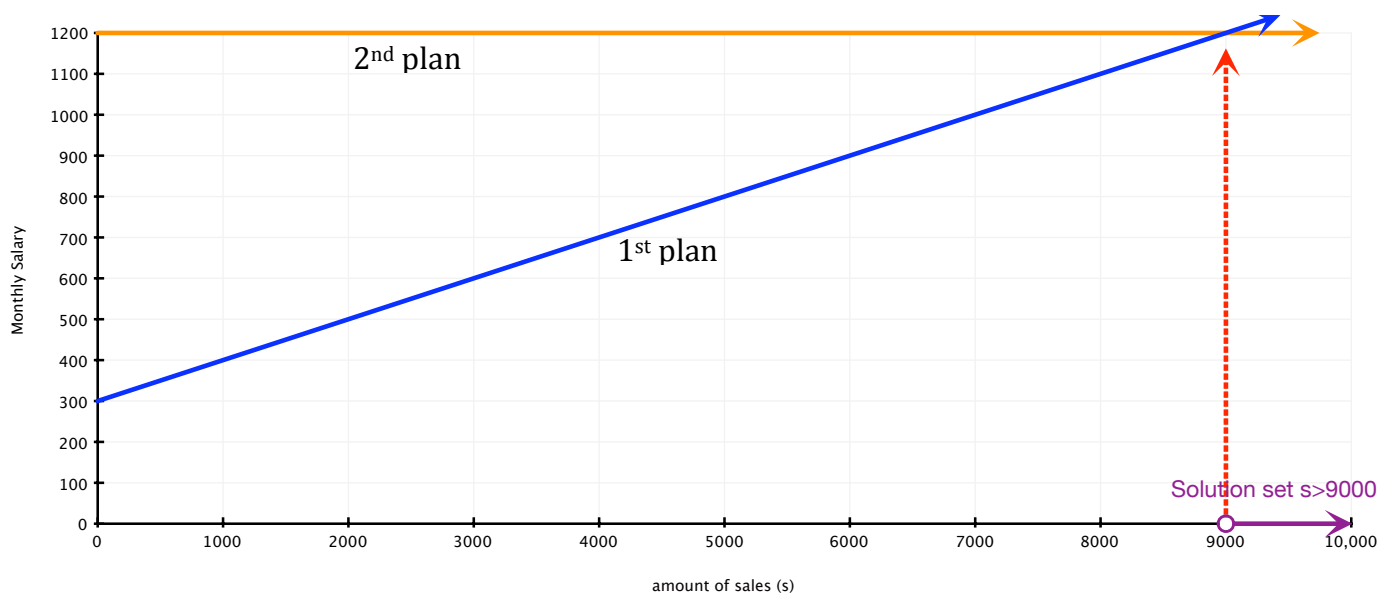
2. Admission to a local summer festival costs $6 for adults and $4 for children. Organizers want to know how many adult and children admissions are needed for income from admissions to exceed $10,000. Interpret the graph below in terms of this situation? State three points that satisfy the inequality.

Inequality $6a + 4c > 10,000$ where a is adult admission (in dollars) and c is child admission (in dollars)
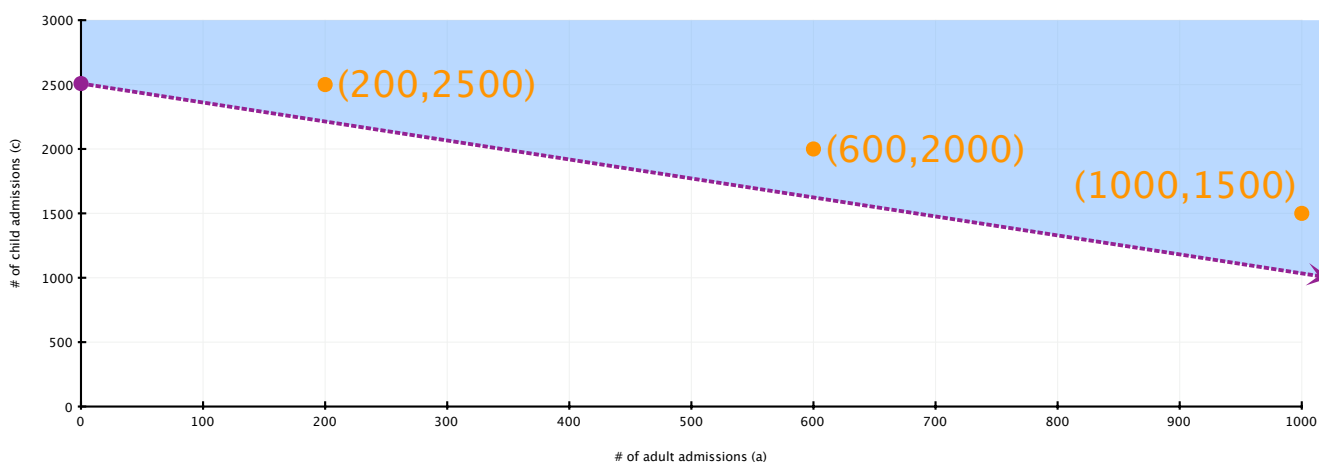
Graph Interpretation

Any point in the shaded region satisfies the inequality $6a + 4c > 10,000$. The dotted line represents the combination of adult and child admissions that equal $10,000. Any point (whole numbers only) in the blue region or beyond represents the combination of sales for the income to exceed $10,000.

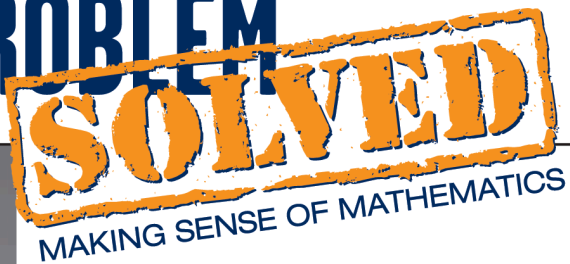**Verification:** Show all three points satisfy the inequality.

$6a + 4c > 10,000$ $6(200) + 4(2500) > 10,000$ $11,200 > 10,000$	$6a + 4c > 10,000$ $6(600) + 4(2000) > 10,000$ $11,600 > 10,000$	$6a + 4c > 10,000$ $6(1000) + 4(1500) > 10,000$ $12,000 > 10,000$

Note: If a point in the non-shaded region is selected such as (600,1000), the point does **not** satisfy the inequality:

$$6a + 4c > 10,000$$
$$6(600) + 4(1000) \ ? \ 10,000$$
$$7600 < 10,000$$

3. Price High School is planning to partner with Papa Paul's Pizza Parlor and Polly's Desserts to raise money for their school. Each pizza sold raises $3 and each dessert raises $2.50 for the school. The school hopes to raise $1000. What does the graph below mean in this situation? State three points that satisfy the inequality.

Inequality $3p + 2.50d > 1000$ where p represents number of pizzas sold and d represents the number of desserts sold.
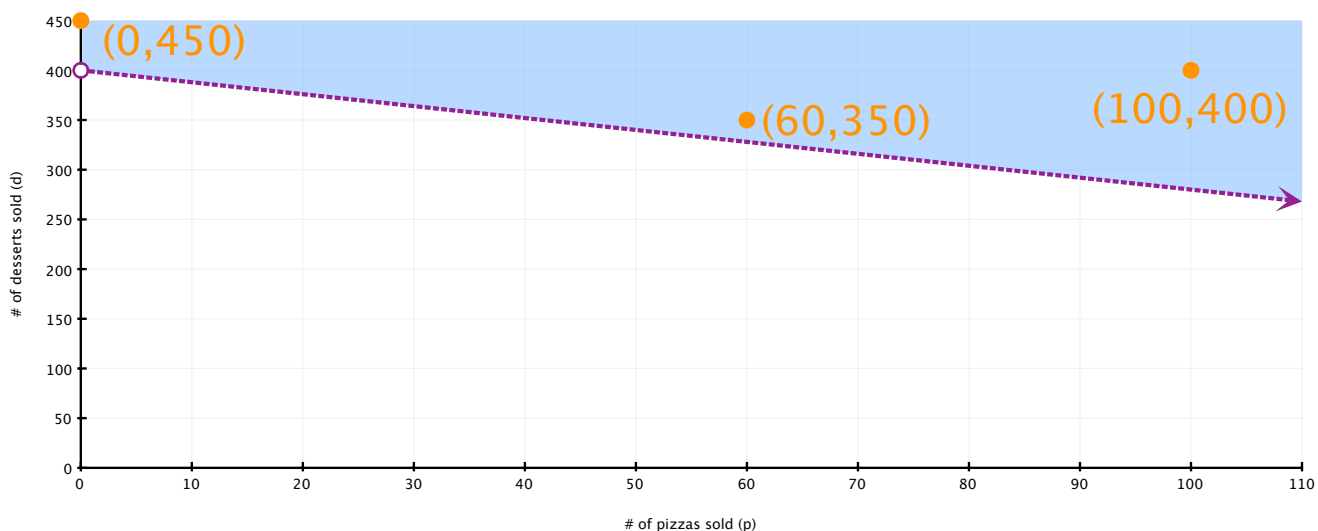
Graph Interpretation

Any point in the shaded region satisfies the inequality $3p + 2.5d > 1000$. The dotted line represents the combination of pizza and dessert sales that equals $1000. Any point (whole numbers only) in the blue region or beyond represents the combination of sales for the income to exceed $1000.

Verification: Show all three points satisfy the inequality.

$3p + 2.50d > 1000$	$3p + 2.50d > 1000$	$3p + 2.50d > 1000$
$3(0) + 2.50(450) > 1000$	$3(60) + 2.50(350) > 1000$	$3(100) + 2.50(400) > 1000$
$1125 > 1000$	$1055 > 1000$	$1300 > 1000$

Note: If a point in the non-shaded region is selected such as (100,100), the point does **not** satisfy the inequality.

$$3p + 2.50d > 1000$$
$$3(100) + 2.50(100) \ ? \ 1000$$
$$550 \ ? \ 1000$$

550 is less than 1000, so the point (100, 100) is not in the shaded region.

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4. The Hollywood Hits video store rents both games and movies. Each game costs $1.50 and each movie rents for $2. Charlie wants to spend less than $15.   What does the graph below mean in this situation? State three points that satisfy the inequality.

Inequality $1.5g + 2m < 15$ where g represents number of games rented and m represents the number of movies rented
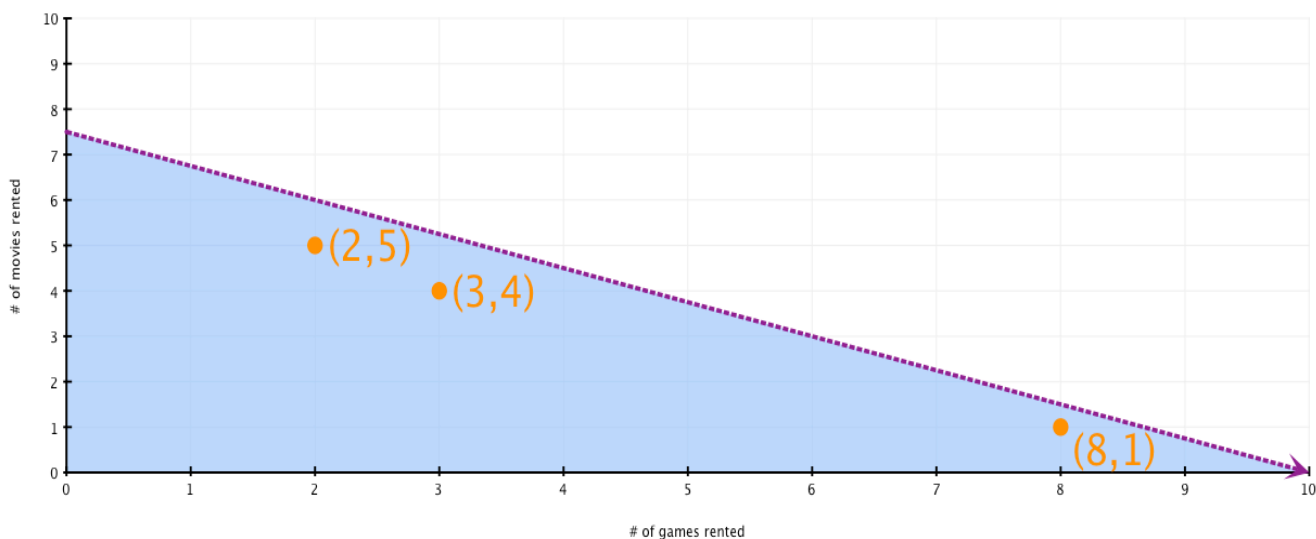
Graph Interpretation
Any point in the shaded region satisfies the inequality $1.5g + 2m < 15$. The dotted line represents the combination of game and movie rentals that equals $15. Any point (whole numbers only) in the blue region represents the combination of rentals that cost less than $15.

Verification: Show all three points satisfy the inequality.

1.5g + 2m < 15 1.5(2) + 2(5) < 15 13 < 15	1.5g + 2m < 15 1.5(3) + 2(4) < 15 12.5< 15	1.5g + 2m < 15 1.5(8) + 2(1) < 15 14< 15

Note: If a point in the non-shaded region is selected such as (10,10), the point does **not** satisfy the inequality.

$$1.5g + 2m < 15$$
$$1.5(10) + 2(10) \; ? \; 15$$
$$35 \; ? \; 15$$

35 is greater than 15, so the point (10, 10) is not in the shaded region.

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