Performance Task: 8.5H
Proportional & Non-Proportional Relationships: Shipping Plans

Mrs. Mancini is starting a small business where she will ship her product direct to customers. She wants to make sure her shipping and handling charges are proportional to the amount of the customer's purchase. Mrs. Mancini is trying to select among 3 different shipping plans:

Plan A: charges a flat rate of $10 plus 5% of the order's subtotal for orders over $100;

Plan B: charges 15% of the order's subtotal for shipping regardless of the order's size;

Plan C: uses a graduated scale of $10 shipping for orders totaling ≤ $100, $20 for orders totaling $100 < total ≤ $200, $30 for orders totaling $200 < total ≤ $300, etc.
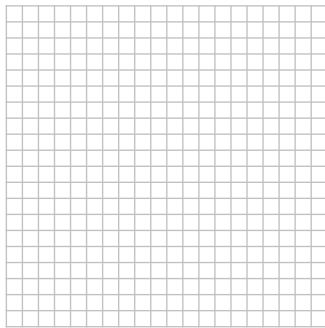
1. If the customer's subtotal is represented as the input, *x*, and the shipping charge is the output, *y*, what equation can be used to determine the amount of the shipping charge for Plan A?

2. When graphed, what are the attributes of the equation for calculating shipping charges using Plan A?
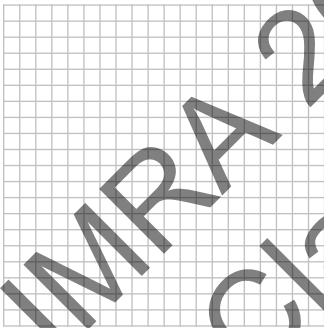
3. For every possible ordered pair of input and output values using Plan A, would the ratio of *y* to *x* always be constant?

4. Does Plan A represent a shipping charge that is proportional to the amount of the customer's order?

5. If the customer's subtotal is represented as the input, *x*, and the shipping charge is the output, *y*, what equation can be used to determine the amount of the shipping charge for Plan B?

6. When graphed, what are the attributes of the equation for calculating shipping charges using Plan B?
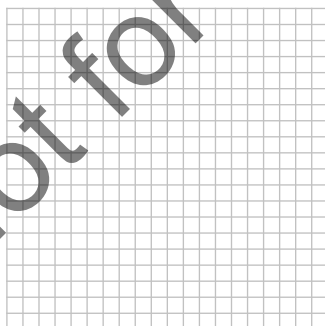
7. For every possible ordered pair of input and output values using Plan B, would the ratio of *y* to *x* always be constant?

8. Does Plan B represent a shipping charge that is proportional to the sub-total of the customer's order?

9. If the customer's subtotal is represented as the input, *x*, and the shipping charge is the output, *y*, what equation can be used to determine the amount of the shipping charge for Plan C?

10. When graphed, what are the attributes of the equation for calculating shipping charges using Plan C?

11. For every possible ordered pair of input and output values using Plan C, would the ratio of *y* to *x* always be constant?

12. Does Plan C represent a shipping charge that is proportional to the sub-total of the customer's order?

13. Which plan(s) meet(s) Mrs. Mancini's needs?