

# Simplex Entering and Leaving Variables

Ben & Jerry's Ice Cream produces three flavors of ice cream, Chocolate Therapy, Vanilla Peanut Butter, and Cherry Garcia. They make \$3, \$5, and \$2 profit from each product, respectively. They are constrained by the amount of local milk purchased, free range chicken eggs purchased, and packaging. Ben & Jerry's can source 22 gallons of milk per week. Each batch of Chocolate requires 1 gallon, each Vanilla requires 2 gallons, and each Cherry Garcia requires 2 gallons. The eggs are from local Free Range farmers and 48 dozen are available each week. Chocolate requires 4 dozen, Cherry Garcia requires 3 dozen, and Vanilla requires 2 dozen. Lastly, the packaging is limited to 15 cases per week. Each product is packaged per case (one case per flavor).

1. How do we determine the variable that will enter the basis (the entering variable)?
  - a. The largest positive value in net evaluation row
  - b. The smallest positive value in the net evaluation row
  - c. The largest negative value in net evaluation row
  - d. Pick your favorite number and go for it
2. How do we determine which variable will leave the basis (leaving variable)?
  - a. Divide the row quantity (Q) by the substrate column of the leaving variable, then select the smallest positive
  - b. Divide the row quantity (Q) by the substrate column of the leaving variable, then select the largest positive
  - c. Flip a coin and hope for the best
3. In mathematics, what is the value of any number divided by zero?
  - a. Zero "0"
  - b. Undefined
  - c. Infinity
4. For our Ben & Jerry's problem, which is the entering variable?
  - a. X1, X2, X3, S1, S2, S3
5. For our Ben & Jerry's problem, which is the leaving variable?
  - a. X1, X2, X3, S1, S2, S3