

REVIEW

### Review Questions

1. A flower shop is preparing bouquets for Valentine's day. They will make small bouquets, medium bouquets and large bouquets from 163 roses, 210 tulips and 300 lilies. The table shows how many of each type of flower is used in each type of bouquet. How many medium bouquets would be made?

		163	210	300
		roses	tulips	lilies
$x = \#$	small	5	4	2
$y = \#$	medium	2	6	11
$z = \#$	large	9	6	8

# med = 20

$163 \text{ roses} = 5x + 2y + 9z$   
 $210 \text{ tulips} = 4x + 6y + 6z$   
 $300 \text{ lilies} = 2x + 11y + 8z$

} ref

REVIEW

2. A bakery makes cherry cookies, cherry bars and cherry breads. They have a total of 11 pounds of cherries available and want twice as many cookies as bars. A batch of cookies makes 100 cookies and uses 2 pounds of cherries. A batch of bars makes 75 and uses 1 pound of cherries. A batch of bread makes 4 breads and uses 1 pound of cherries. The cookies sell for \$0.40 each, the bars for \$1.00 each and the breads for \$3.00 each. If the total revenue is \$306, how many cherry breads are made?

$x$  = # of cherry cookies  
 $y$  = # of cherry bars  
 $z$  = # of cherry breads

$$\boxed{\begin{array}{l} \# \text{ cookies} \\ x \end{array}} \quad \boxed{\begin{array}{l} \# \text{ bars} \\ y \end{array}} \Rightarrow x = 2y$$

$$R = 306 = 0.4x + 1y + 3z$$

$$11 \text{ lbs cherries} = 2 \left( \frac{x}{100} \right) + 1 \left( \frac{y}{75} \right) + 1 \left( \frac{z}{4} \right)$$

$$\left[ \begin{array}{ccc|c} 1 & -2 & 0 & 0 \\ 0.4 & 1 & 3 & 306 \\ \frac{2}{100} & \frac{1}{75} & \frac{1}{4} & 11 \end{array} \right] \xrightarrow{\text{ref}} (x, y, z) = (300, 150, \underline{12})$$

REVIEW

3. The reduced augmented matrix below came from a word problem where  $x$ ,  $y$ ,  $z$ , and  $u$  represent the number of freshmen, sophomores, juniors, and seniors in a math class respectively. How many valid solutions does this system of equations have? 5

$$\begin{array}{c} \textcircled{x} \quad \textcircled{y} \quad \textcircled{z} \quad u \rightarrow t \\ \rightarrow \left[ \begin{array}{ccc|c} \textcircled{1} & 0 & 0 & -2 & -5 \\ 0 \rightarrow \textcircled{1} & 0 & 0 & 0 & 10 \\ 0 & 0 \rightarrow \textcircled{1} & 4 & 0 & 30 \end{array} \right] \end{array}$$

$$\begin{array}{l} x - 2t = -5 \\ y = 10 \\ z + 4t = 30 \end{array}$$

$$(x, y, z) = (2t - 5, 10, 30 - 4t, t)$$

$t = \# \text{ of seniors}$

$t = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$

$\underbrace{0, 1, 2, 3, 4, 5, 6, 7}_{x \text{ negative}}$        $\underbrace{8, 9, 10}_{z \text{ neg}}$

REVIEW

4. A store has 12 job applicants. The store needs one cashier, one assistant and three stockers. How many ways can the store fill these positions?

# ways =                     

$$\frac{12}{C} \cdot \frac{11}{A} \cdot \frac{C(10,3)}{S} = 15840$$

$$\frac{C(12,5)}{\text{Pick JOB}} \cdot \frac{5}{C} \cdot \frac{4}{A} = 15,840$$

REVIEW

5. John, Sue, Beth and 3 other friends are lining up for a picture. How many ways can all of them line up to take the picture if Sue must be directly between John and Beth?

$\boxed{JSB}$  or  $\boxed{BSJ}$  with 3 people

$$\frac{4!}{arr} \cdot \frac{2}{\substack{JSB \\ \text{or} \\ BSJ}} = 48$$

REVIEW

6. A potter wants to make  $x$  mugs and  $y$  platters to maximize her profit of  $P = 2x + 3y$ . Her time and clay constraints leave a feasible region bounded by  $(0, 0)$ ,  $(30, 0)$ ,  $(9, 18)$ ,  $(18, 12)$ , and  $(0, 20)$ . How many solutions give the maximum revenue of \$72?

vertex $x$	$P = 2x + 3y$
$(0, 0)$	0
$(30, 0)$	60
$(9, 18)$	72
$(18, 12)$	72
$(0, 20)$	60

$P = 72 = 2x + 3y$   
 $\Rightarrow y = 24 - \frac{2}{3}x$  for  $9 \leq x \leq 18$   
 $\Rightarrow x = 9, 12, 15, 18$  (4 solutions)

REVIEW

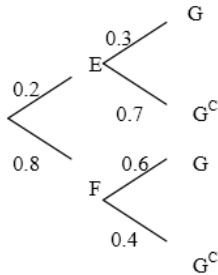
7. A shelf at the beauty store has 9 bottles of shampoo for sale. There are 5 identical bottles of Brand A and 4 different bottles of Brand D. How many distinguishable ways can these bottles be arranged on the shelf?

$$\frac{9!}{5! 1! 1! 1! 1!} = 3024$$

A                  D

REVIEW

### 8. Use the tree diagram



(a)  $P(G) = \underline{(0.2)(0.3) + (0.8)(0.6) = 0.54}$

(b) E and F are mutually exclusive

(A) True    (B) False    (C) Can't be determined

(c) E and G are independent

(A) True     (B) False    (C) Can't be determined



REVIEW

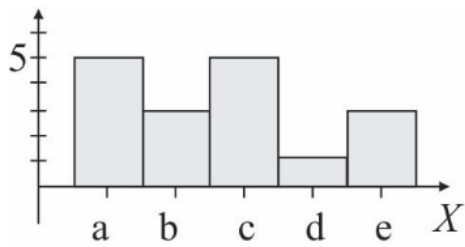


Figure I

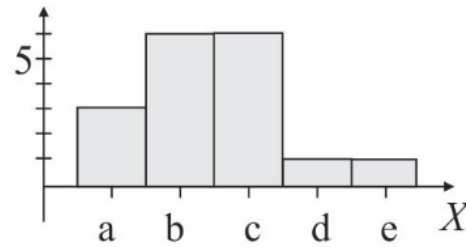


Figure II

9. Which histogram has the larger standard deviation?

- (A) Figure I (B) Figure II (C) They are about the same

REVIEW

**10.** An off-brand of blank CD's has a 0.8% chance of a single disc being defective. You have a spindle of 100 of these blank CD's. What is the probability that you find more than 3 defective CD's?

$$1 - \text{binomcdf}(100, .008, 3) = 0.0087$$