Pre-Calculus A
Section 7.3 Even More Practice!

Name : Key
Date : _____ Period : ___

1. $\begin{cases} 4x+4y+z=24 \text{ ①} \\ 2x-4y+z=0 \text{ ②} \\ 5x-4y-5z=12 \text{ ③} \end{cases}$ * Eliminate y

Equations ① & ②
$4x+4y+z=24$
$2x-4y+z=0$
$6x+2z=24$ new 1

Equations ① & ③
$4x+4y+z=24$
$5x-4y-5z=12$
$9x-4z=36$ new 2

$2(6x+2z=24)$ → $12x+4z=48$
$9x-4z=36$
$21x=84$
$x=4$

Solution: $(4, 2, 0)$

Sub into new 1:
$6(4)+2z=24$
$24+2z=24$
$2z=0$
$z=0$

Sub into orig eqn 1:
$4(4)+4y+0=24$
$16+4y=24$
$4y=8$
$y=2$

2. $\begin{cases} 6r-s+3t=-9 \text{ ①} \\ 5r+5s-5t=20 \text{ ②} \\ 3r-s+4t=-5 \text{ ③} \end{cases}$ * Eliminate s

Equations ① & ②
$5(6r-s+3t=-9)$ → $30r-5s+15t=-45$
$5r+5s-5t=20$
$35r+10t=-25$ new 1

Equations ② & ③
$5r+5s-5t=20$
$5(3r-s+4t=-5)$ → $5r+5s-5t=20$
$15r-5s+20t=-25$
$20r+15t=-5$ new 2

$15(35r+10t=-25)$ → $525r+150t=-375$
$-10(20r+15t=-5)$ → $-200r-150t=50$
$325r=-325$
$r=-1$

Sub into new 1:
$35(-1)+10t=-25$
$-35+10t=-25$
$10t=10$
$t=1$

Sub into orig eqn 1:
$6(-1)-s+3(1)=-9$
$-6-s+3=-9$
$-3-s=-9$
$-s=-6$
$s=6$

Solution: (r,s,t)
$(-1,6,1)$

3. $\begin{cases} -x-5y+z=17 & \Rightarrow z = 17+x+5y \\ -5x-5y+5z=5 \\ 2x+5y-3z=-10 \end{cases}$

Sub into Eqn 2:

$-5x-5y+5(17+x+5y)=5$

$-5x-5y+85+5x+25y=5$

$20y+85=5$

$20y=-80$

$y=-4$

Sub into eqn 3:

$2x+5y-3(17+x+5y)=-10$

$2x+5y-51-3x-15y=-10$

$-x-10y-51=-10$

$-x-10y=41$

$-x-10(-4)=41$

$-x+40=41$

$-x=1$

$x=-1$

Sub $x=-1$ and $y=-4$ into orig eqn 1:

$z=17+(-1)+5(-4)$

$z=17-1-20$

$z=-4$

Solution: $(-1,-4,-4)$

4. An arcade in Lynchburg, Tennessee uses 3 different colored tokens for their game machines. For $20, you can purchase any of the following mixtures of tokens: 14 gold, 20 silver, and 24 bronze; OR 20 gold, 15 silver, and 19 bronze; OR 30 gold, 5 silver, and 13 bronze. What is the monetary value of each token?

x: Gold, y: Silver, z: Bronze

Mixture 1: $14x+20y+24z=20$

Mixture 2: $20x+15y+19z=20$

Mixture 3: $30x+5y+13z=20$

*Eliminate y with coefficient of 60

① and ②

$3(14x+20y+24z=20)$

$-4(20x+15y+19z=20) \Rightarrow$

$42x+60y+72z=60$

$-80x-60y-76z=-80$

$-38x-4z=-20$ new 1

① and ③ *Eliminate y with coefficient of 20

$14x+20y+24z=20$

$-4(30x+5y+13z=20) \Rightarrow$

$14x+20y+24z=20$

$-120x-20y-52z=-80$

$-106x-28z=-60$ new 2

$-7(-38x-4z=-20)$

$-106x-28z=-60 \Rightarrow$

$266x+28z=140$

$-106x-28z=-60$

$160x=80$

$x=.50$

Sub into new 1:

$-38(.50)-4z=-20$

$-19-4z=-20$

$-4z=-1$

$z=0.25$

Sub into orig. 1:

$14(.50)+20y+24(.25)=20$

$7+20y+6=20$

$20y=7$

$y=.35$

Solution: Gold: $0.50
Silver: $0.35
Bronze: $0.25

smallest : x , middle : y , largest : z

5. A triangle has three angles (duh, Ms. R). The middle angle measures 5° more than twice the smallest angle, and the largest angle measures 11° less than 3 times the measure of the smallest angle. Find the measures of the three angles.

Equation 1 (Δ sum): $x+y+z=180$

Equation 2: $y=5+2x$

Equation 3: $z=3x-11$

$$\Rightarrow \begin{cases} ① & x+y+z=180 \\ ② & 2x-y+0z=-5 \Rightarrow y=5+2x \\ ③ & 3x+0y-z=11 \Rightarrow z=3x-11 \end{cases}$$

Sub $y=5+2x$ into eqn 1:

$x+5+2x+z=180$

$3x+z=175$ new 1

Sub $z=3x-11$ into new 1:

$3x+3x-11=175$

$6x=186$

$x=31$

Sub $x=31$ into new 1:

$3(31)+z=175$

$93+z=175$

$z=82$

Sub into orig eqn 1:

$31+y+82=180$

$y+113=180$

$y=67$

Solution: smallest = 31°
middle = 67°
largest = 82°

Answer Key:

1. (4, 2, 0)
2. (-1, 6, 1)
3. (-1, -4, -4)
4. Gold: $0.50, Silver: $0.35, Bronze: $0.25
5. Small: 31°, Middle: 67°, Large: 82°