3.6 Solving Systems of Equations in 3 Variables

1 **Solve for (x, y, z):**

$(1, -2, 3)$

① $2x + y + 3z = 9$
② $x - 2y + z = 8$
③ $-4x + 3y + 2z = -4$

② $x + 4 + 3 = 8$ $\quad x = 1$

(2)① $4x + 2y + 6z = 18$
③ $-4x + 3y + 2z = -4$
$5y + 8z = 14$

① $2x + y + 3z = 9$
(-2)② $-2x + 4y - 2z = -16$
$-(5y + z = -7)$
$5y + 3 = -7$
$5y = -10$
$y = -2$

$-5y - z = 7$
$7z = 21$
$z = 3, \quad y = -2$

2 **Over a 1-week period, 255 VHS Spirit Items were sold. The number of coffee mugs (M) sold was 5 less than the number of T-shirts (T) sold, and the number of paw print decals (D) sold was 5 more than the number of t-shirts and mugs combined. How many of each item were sold?**

Substitute

① $M + T + D = 255$ $\quad T = M+5$
② $M + 5 = T$
③ $D = T + M + 5$ $\quad T = M+5$

mugs = 60
T-shirts = 65
decals = 130

$2M + 5 + D = 255$
① $2M + D = 250$
③ $D = 2M + 10$

① $4M + 10 = 250$
$M = 60$