3.6 Solving Systems of Equations in 3 Variables

1 Solve for (x, y, z):   Linear Combination

① $2x + y + 3z = 9$ ② $1 + 4 + z = 8$ $(1, -2, 3)$
② $x - 2y + z = 8$ $\boxed{z = 3}$
③ $-4x + 3y + 2z = -4$

$(x-2)$ ② $-2x + 4y - 2z = -16$ ① $2x + y + 3z = 9$
③ $-4x + 3y + 2z = -4$ $(x\cdot 3)$ ② $-3x + 6y - 3z = -24$

$-6x + 7y = -20$ $-1(-x + 7y = -15)$

$-6x + 7y = -20$ $\boxed{y = -2}$
$x - 7y = 15$

$\boxed{x = 1}$

2

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

(total) ① $M + T + P = 255$ Subst.

(mugs)   ② $M = \boxed{T - 5}$ 65 Tshirts
(paws)   ③ $P = M + T + 5$ 130 paws
                                    60 mugs

① $(T-5) + T + P = 255$ $2T + P = 260$
③ $P = (T-5) + T + 5$ $P = \boxed{2T}$

$4T = 260$