P1:

The weights in pounds of parcels arriving at a package delivery company's warehouse can be modeled by an $N(5, 16)$ normal random variable X.

a) **What is the probability that a randomly selected parcel weighs between 1 and 10 pounds?**
b) **What is the probability that a randomly selected parcel weighs more than 9 pounds?**

Solution:

Since $X \sim N(5,16)$, we have $\mu = 5$ and $\sigma^2 = 16$.

a) $P(1 < X < 10) = P\left(\frac{1-5}{4} < Z < \frac{10-5}{4}\right) = P(-1 < Z < 1.25)$
$= P(-1 < Z < 0) + P(0 < Z < 1.25)$
$= P(0 < Z < 1) + P(0 < Z < 1.25)$
$= 0.3413 + 0.3943 = 0.7356$ (Use table)

b) $P(X > 9) = P\left(Z > \frac{9-5}{4}\right) = P(Z > 1)$
$= 0.5 - P(0 < Z < 1)$
$= 0.5 - 0.3413$
$= 0.1587$ (Use table)