# Equitable Equations: *Uniform random variables*

## Problem 1

Suppose the random variable $X$ has a uniform distribution on the interval $[-1, 7]$.

(a) Compute $P(X > 0)$.

$P(X>0) = \frac{2}{8}$

(b) Compute $P(X < 0)$.

$P(X<0) = \frac{7}{8}$ or $1 - \frac{2}{8}$

(c) Briefly explain why $P(X = 0)$ is zero.

The numbers are continous random variables so the chance of $X=0$ is infinitesimal

(d) Compute $P(X < 2 \text{ or } X \geq 4)$.

$P(X<2) + P(X \geq 4)$

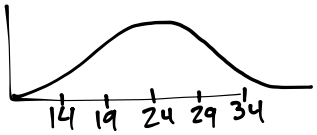
$\frac{3}{8} + \frac{3}{8} = \frac{6}{8}$

# Equitable Equations: *Calculating with the normal distribution*

## Problem 1

Suppose $X$ has a normal distribution with mean 24 and standard deviation 5.

(a) Sketch the distribution. Label at least 5 points on the $x$-axis.

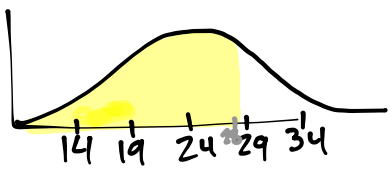



(b) Fill in the blank: $P($19 $< X <$ 29$) = 68\%$. Use the empirical rule.

(c) Fill in the blank: $P($14 $< X <$ 34$) = 95\%$. Use the empirical rule.

(d) Fill in the blank: $P($9 $< X <$ 39$) = 99.7\%$. Use the empirical rule.

(e) Sketch $P(X \leq 28)$.




(f) Compute $P(X \leq 28)$. Include both $R$ code and a numerical answer.

pnorm(28,24,5) = 0.788 = 78.8%

(g) Compute $P(X > 26)$. Include both $R$ code and a numerical answer.

1 - pnorm(26,24,5) = 0.345 = 34.5%

(h) Compute $P(26 \leq X \leq 28)$. Include both $R$ code and a numerical answer.

pnorm(28,24,5) - pnorm(26,24,5) = 0.133 = 13.3%