

M:11. Hw

11.1.1

a.) $\{1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 25, 30, 36\}$

b.) $\frac{5}{9}$

11.1.2

a.) $\{0, 1, 2, 3, 4\}$

b.)

$x=0$	$1 \cdot \left(\frac{48}{52}\right)^5 = 0.6701$
$x=1$	$5 \cdot \frac{4}{52} \left(\frac{48}{52}\right)^4 = 0.2792$
$x=2$	$\left(\frac{5}{52}\right) \cdot \left(\frac{4}{52}\right)^2 \left(\frac{48}{52}\right)^3 = 0.041654$
$x=3$	$\left(\frac{5}{52}\right) \cdot \left(\frac{4}{52}\right)^3 \left(\frac{48}{52}\right)^2 = 0.00387$
$x=4$	$\left(\frac{5}{52}\right) \cdot \left(\frac{4}{52}\right)^4 \left(\frac{48}{52}\right) = 0.000161$
$x=5$	$1 \cdot \left(\frac{4}{52}\right)^5 \cdot 1 = 0.000026$

11.1.3

a.) $\{0, 1, 2\}$

b.)

$G=0$	$\frac{3}{10} \cdot \frac{2}{9} = 0.0667$
$G=1$	$\frac{2}{4} \cdot \frac{3}{9} = 0.4667$
$G=2$	$\frac{1}{10} \cdot \frac{6}{9} = 0.4667$

11.2.1

a.) $E[G] = 1 \cdot 0.4667 + 2 \cdot 0.4667 = 1.4$

11.2.2

a.) $\frac{1}{6} \cdot 2 + \frac{1}{6} \cdot 1 + \frac{2}{3} \cdot (-1) = -\$0.17 \quad -0.17$

11.3.1

a.)

$P(1) = 0.3955$	
$P(2) = 0.26367$	$5 \cdot 0.25 = 1.25$
$P(3) = 0.03789$	
$P(4) = 0.014648$	
$P(5) = 0.000976$	

11.3.2

a) $\frac{5}{40} = \frac{1}{8}$ $\frac{1}{8} \cdot 7 = \frac{7}{8}$

$E[F] = \boxed{\frac{7}{8}}$

11.3.4

$$\frac{1}{10} + \frac{2}{90} + \frac{3}{720} + \frac{4}{5040} + \frac{5}{30240} + \frac{6}{181440} + \frac{7}{967200} + \frac{8}{3628800} + \frac{9}{10!} + \frac{10}{10!}$$

$E[x] = \boxed{0.1274}$

11.4.1

a) $\binom{100}{2} \cdot 0.01^2 \cdot 0.99^{98} = \boxed{0.1847}$

b) $1 - (0.99^{100}) - (100 \cdot 0.01 \cdot 0.99^{99}) = \boxed{0.2642}$

c) $100 \cdot 0.01 = \boxed{1}$

d) $1 - 0.99^{50} - (50 \cdot 0.01 \cdot 0.99^{49}) = \boxed{0.08944}$

11.4.3

a) $P(H \leq 4) = P(0) + P(1) + P(2) + P(3)$
 $= \boxed{0.171875}$

b) $1 - 0.6^{1961} = \boxed{0.35039}$