

1) $30/7 = 4 \text{ weeks} + 2 \text{ days}$

The month must start on a Monday or Tuesday

$$2/7 = .2857 = 28.57\%$$

2) a) $\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = 1/216$

b) $\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = 1/216$

c) $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = 1/8$

3) a) $10+40+50 \quad 40/50 = 4/5$

b) The outcome of the second trial is independent because the results of the second trial did not rely on the first

4) a) $1/(25+50) = 1/75$

b) $(25-1)/(25+50) = 24/75$

c) I don't see any issues. Obviously no false negatives would be better but if only $1/200$ students is affected this is a lot of resources dedicated to something that affect very few students.

5) a) $G > S = 1/2 \quad G > B = 1/3$

if $S < G < B$, 1 case
 $\frac{1}{2} \cdot \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$

if S and $B < G$, 6 cases
 $\frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$

if $B < G < S$, 2 cases
 $\frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$

if S and $B > G$, -3 cases
 $\frac{1}{2} \cdot \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$

Cases	$P(x)$	x^2	$x^2 \cdot P(x)$
1	$\frac{1}{3}$	1	$\frac{1}{3}$
2	$\frac{1}{6}$	4	$\frac{2}{3}$
6	$\frac{1}{6}$	36	6
-3	$\frac{1}{3}$	9	3
$E(x) = 2\frac{2}{3}$		$E(x^2) = 10$	

$$\sigma^2 = E(x^2) - [E(x)]^2$$

$$\sigma = \sqrt{\sigma^2}$$

$$\text{Var} = 10 - (2\frac{2}{3})^2$$

$$\text{Std dev} = \sqrt{10 - (2\frac{2}{3})^2}$$

$$= 3.09$$

b) If there is football and beer involved, we're probably already drunk meaning our judgement is impaired and everything seems like a good idea. In addition, any good friend winning a bet like this would share the beers.

6) a) No. Believing that global warming is independent of political affiliation.

b) $.2 + .6 - .18 = .62$

c) $.18/.2 = .9$

d) $.11/.33 = 1/3$

e) They are not fully independent but conservatives frequently choose to ignore science while democrats listen to people with degrees

f) $.06/.31 = .176$

	Grad	Asst grad	Total
male	19	41	60
female	12	28	40
Total	31	69	100

a) $19/100 = .19$
Joint probability

b) $60/100 = .6$

c) $31/100 = .31$
marginal probability

d) $28/69 = .405$
conditional probability

7) $X = 22 \quad E(x) = 1.8 \quad SD = 1.2$

a) $SD = \sqrt{22 \cdot 1.2^2} \quad \text{mean} = 22 \cdot 1.8$
 $= 5.63 \quad = 39.6$

b) $SD = 5.63 \cdot 1000 \quad \text{mean} = 39.6 \cdot 1000$
 $= 5630 \quad = 3960$

8) mean = 72 SD = 12 \rightarrow exam 70% of grade

mean = 95 SD = 4 \rightarrow project 30% of grade

$$\text{Mean} = (.7 \cdot 72) + (.3 \cdot 95) = 78.9$$

$$SD = 4^2 + 12^2 = 12.649$$

9) mean = 74 SD = 9 n = 36

$$\text{mean} = 74$$

$$SD = 6/\sqrt{n} = 9/\sqrt{36} = 9/6 = 1.5$$