Given 2 independent random vars X and Y. -2 -1 3 -1 0 2 and 0.2 0.3 0.5 0.2 0.4 0.4. Show distribution and calculate Expected value and variation of random variables 3X-2Y, X*x+y*y and X*Y.

X	-2	-1	3	-1	0	2
Y	0.2	0.3	0.5	0.2	0.4	0.4

Expected value:

X:

$$-2 \cdot \left(\frac{1}{6}\right) - 1 \cdot \left(\frac{1}{3}\right) + 2 \cdot \left(\frac{1}{6}\right) + 3 \cdot \left(\frac{1}{6}\right) = -\frac{1}{3} + \frac{1}{2} = \frac{1}{6}$$

Y:

$$0.2 \cdot \left(\frac{1}{3}\right) + 0.4 \cdot \left(\frac{1}{3}\right) + 0.5 \cdot \left(\frac{1}{6}\right) + 0.3 \cdot \left(\frac{1}{6}\right) = \frac{1}{3}$$

Variation:

X:

$$X_{min} = -2, X_{max} = 3$$

Y:

$$Y_{min} = 0.2, Y_{max} = 0.5$$

1. For $Z = 3X - 2Y$:
    a. Expected value: $\frac{3}{6} - \frac{2}{3} = -\frac{1}{6}$
    b. Variation: $Z_{min} = (-2 \cdot 3 - 0.2 \cdot 2) = -6.4$, $Z_{max} = (3 \cdot 3 - 0.5 \cdot 2) = 8$
2. For $Z = X^2 + Y^2$:
    a. Expected value: $\frac{1}{36} + \frac{1}{9} = \frac{5}{36}$
    b. Variation: $Z_{min} = ((-2)^2 + (0.2)^2) = 4.04$, $Z_{max} = ((3)^2 + (0.5)^2) = 9.25$
3. For $Z = XY$:
    a. Expected value: $\frac{1}{6} \cdot \frac{1}{3} = \frac{1}{18}$
    b. Variation: $Z_{min} = 0.2 \cdot (-2) = -0.4$, $Z_{max} = 3 \cdot 0.5 = 1.5$