362(24) ① "y varies directly as x" \( \rightarrow \) \( y = kx \)

② \( y = 55 \) when \( x = 5 \)

These values will allow us to calculate \( k \):\[
55 = k(5) \quad \rightarrow \quad k = \frac{55}{5} = 11
\]

So the equation of variation for the given conditions is: \( y = 11x \)

To find \( y \) when \( x = 13 \): \( y = 11(13) = 143 \)

362(36) "\( C \) varies jointly as \( A \) and \( T \)" \( \rightarrow \) \( C = kAT \)

\( C = 175 \) when \( A = 2100 \) and \( T = 4 \)

We can use these values to find \( k \):

\[
175 = k(2100)(4) \quad \rightarrow \quad k = \frac{175}{8400} = \frac{7}{336}
\]

So the equation of joint variation is:

\[
C = \frac{7}{336}AT
\]

For \( A = 2100 \) and \( T = 6 \), \( C = \frac{7}{336}(2100)(6) = \frac{7 \times 2100}{6} = \frac{14700}{6} = 2450 \)

365(46) "Gravitational force varies inversely with square of distance" \( \rightarrow \) \( \text{Force} = \frac{k}{(\text{distance})^2} \)

\[ F = \frac{k}{d^2} \]

\( F = 0.4 \) when \( d = 8000 \) \( \rightarrow \) \( 0.4 = \frac{k}{8000^2} \)

or \( k = 0.4(8000)^2 = 25600000 \)

Then \( F = \frac{25600000}{d^2} \)

Find \( F \) if \( d = 6000 \) mi: \( F = \frac{25600000}{(6000)^2} = \frac{25600000}{36000000} = \frac{32}{45} \)

\( \approx 0.71 \) lb