VARIATION

30 mm 4 mm
30 mm 6 mm

$F = 2D$

↑ (K) CONSTANT OF PROPORTIONALITY

$$\text{HAPPINESS} = \frac{(\text{CIRCUS})(\text{SON})}{(\text{ERRANDS})}$$

SOLVING VARIATION PROBLEMS

1. DETERMINE TYPE
   - DIRECT : $y = kx$
   - INVERSE : $y = \frac{k}{x}$
   - JOINT : $y = kxz$
   - COMBO : MIX OF ABOVE
2. PICK VARIABLES THAT MAKE SENSE
3. LOOK FOR ONE EXAMPLE AND SOLVE FOR K
4. FIND WHAT THEY REALLY WANT

#1

① DIRECT : $y = kx$
② $y = kx$
③ $25 = k(5)$
$\frac{25}{5} = \frac{5k}{5}$
$5 = k$
$y = 5x$
④ $y = 5(7)$
$y = 35$

#2

① INVERSE : $y = \frac{k}{x}$
② $y = \frac{k}{x}$
③ $8 = \frac{k}{20}$
$8(20) = \frac{k}{20}(20)$
$160 = k$
$y = \frac{160}{x}$
④ $y = \frac{160}{35}$
$y = \frac{32}{7}$

#3

① JOINT : $y = kxz$
② $y = kxz$
③ $30 = k(4)(3)$
$30 = 12k$
$\frac{30}{12} = k$
$\frac{5}{2} = k$
$y = \frac{5}{2}(xz)$
④ $y = \frac{5}{2}(10)(7)$
$= 175$

$\frac{35}{7}$
175

#4

① DIRECT : $y = kx$
② $p = kn$
③ $4131 = k(810)$
$\frac{4131}{810} = k$
$5.1 = k$
$p = 5.1n$
④ $p = 5.1(520)$
$p = 2652$

#5

① INVERSE : $y = \frac{k}{x}$
② $A = \frac{k}{D^2}$
③ $13.1 = \frac{k}{10.2^2}$
$13.1 = \frac{k}{104.04}$
$13.1(104.04) = k$
$1362.924 = k$
$A = \frac{1362.924}{D^2}$
④ $A = \frac{1362.924}{27.5^2}$
$A = 1.8$