A 60 kg man stands on a scale in an elevator which is accelerating at rate, A (upward when A is positive). His weight by the scale is:

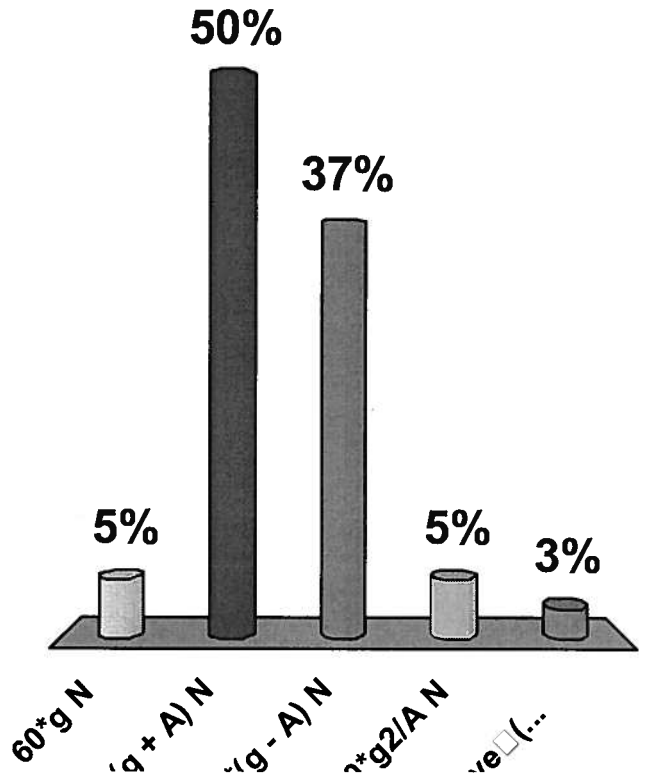
a) 60*g N

✓b) 60*(g + A) N

c) 60*(g - A) N

d) $60*g^2/A$ N

e) None of the above
(Note: g = 9.8m/$s^{2)}$



The correct answer is (b):
$W = 60(g+A)$

- By NII, $F^{NET} = MA = F_{Scale} + F_{Grav}$
  and $F_{Grav} = -Mg$
- Therefore, $F_{Scale} = MA + Mg$
  $= 60(A+g)$
  And (b) is the correct answer.
- We can also get the same result by working in the accelerated frame and adding the pseudo-force, $F_{Pseudo} = -MA$ to the physical gravitational force; as follows on the next slide.

The correct answer is (b):
$W = 60(g+A)$

- In an inertial frame, a = A, and NII is:
  $\mathbf{F}_{\mathbf{Physical}} = F_G + F_S = MA = -Mg + W$;
- Then $W = M(g+A) = 60(g+A)$, answer (b), as on the preceding slide.

- In Accelerating frame, $a_A = 0$, but need to add $\mathbf{F}_{\mathbf{Pseudo}} = -MA$ to $\mathbf{F}_{\mathbf{Physical}}$. Then
  $-MA + W - Mg = Ma_A = 0$,
  (since the man is at rest in Acc-frame)
- Thus, again, W = M(g+A); answer (b) is correct
- (Note one must always get the same physical result whichever way one does any correct calculation.)