1. Given: $v = 110$ km/h $= 30.6$ m/s, $t = 2.0$ s.

   Find: x.

   Solution: $x = vt = (30.6 \text{ m/s})(2.0 \text{ s}) = \boxed{61 \text{ m}}$.

2. Given: $v_i = 12 \text{ m/s}, v_f = 25 \text{ m/s}, t = 6.0$ s.

   Find a, x.

   Solution: $v_f = v_i + at$. Thus, $a = \dfrac{v_f - v_i}{t} = \dfrac{(25 \text{ m/s}) - (12 \text{ m/s})}{(6.0 \text{ s})} = \boxed{2.2 \text{ m/s}^2}$.

   $v_f^2 = v_i^2 + 2ax$. Thus, $x = \dfrac{v_f^2 - v_i^2}{2a} = \dfrac{(25 \text{ m/s})^2 - (12 \text{ m/s})^2}{(2.2 \text{ m/s}^2)} = \boxed{110 \text{ m}}$.

3. Given: $v_i = 20 \text{ m/s}, v_f = 0 \text{ m/s}, x = 85$ m.

   Find a.

   Solution: $v_f^2 = v_i^2 + 2ax$. Thus, $a = \dfrac{v_f^2 - v_i^2}{2x} = \dfrac{(0 \text{ m/s})^2 - (20 \text{ m/s})^2}{(85 \text{ m})} = \boxed{-2.4 \text{ m/s}^2}$.

4. Given: $v = 95 \text{ km/h}, x = 8.5$ km.

   Find: t.

   Solution: $t = \dfrac{x}{2v} = \dfrac{(8.5 \text{ km})}{2(95 \text{ km/h})} = \boxed{160 \text{ s}}$.

5. Given: $x = 50 \text{ m}, v_i = 90 \text{ km/h} = 25 \text{ m/s}, v_f = 0$ m/s.

   Find: a.

   Solution: $v_f^2 = v_i^2 + 2ax$.

   Thus, $a = \dfrac{v_f^2 - v_i^2}{2x} = \dfrac{(0 \text{ m/s})^2 - (25 \text{ m/s})^2}{2(50 \text{ m})} = -12.5 \text{ m/s}^2 \approx \boxed{-10 \text{ m/s}^2}$.

6. We assume constant velocity for the runner in the first 27 minutes.

   $$v_0 = \frac{(10000 \text{ m}) - (1100 \text{ m})}{(27 \times 60 \text{ s})} = 5.49 \text{ m/s}.$$

   If the runner accelerate for t seconds, the new speed would be:

   $$v = v_0 + at = 5.49 \text{ m/s} + (0.20 \text{ m/s}^2)t;$$

   and the distance covered would be:

   $$x_1 = v_0 t + \frac{1}{2}at^2 = (5.49 \text{ m/s})t + \frac{1}{2}(0.20 \text{ m/s}^2)t^2.$$

   The remaining distance will be run at the new speed, so we have

   $$1100 \text{ m} - x_1 = v(180 \text{ s} - t); \text{ or}$$

   $$1100 \text{ m} - (5.49 \text{ m/s})t - \frac{1}{2}(0.20 \text{ m/s}^2)t^2 = [5.49 \text{ m/s} + (0.20 \text{ m/s}^2)t](180 \text{ s} - t).$$

This is a quadratic equation:

$$0.10t^2 - 36t + 111.8 = 0, \text{ with the solutions } t = -363 \text{ s}, +3.1 \text{ s}.$$

Because $t = 0$ when the acceleration begins, the positive answer is the physical answer: $t = \boxed{3.1 \text{ s}}$.

7. $\boxed{\text{A}}$. $v = \dfrac{(3 \text{ km}) + (7 \text{ km})}{(0.3 + 0.70) \text{ h}} = \dfrac{10}{1} = 10 \text{ km/h}.$

8. $\boxed{\text{E}}$. $a = \dfrac{v_f - v_i}{t} = \dfrac{20 - 0}{5} = 4 \text{ m/s}.$

9. $\boxed{\text{A}}$. First, we calculate the acceleration of the car.

$$a = \frac{v_f - v_i}{t} = \frac{20 - 0}{15} = \frac{4}{3} \text{ m/s}^2.$$

Then,

$$x = \frac{v_f^2 - v_i^2}{2a} = \frac{20^2 - 0^2}{2 \times \frac{4}{3}} = 150 \text{ m}.$$

10. $\boxed{\text{E}}$. First, we calculate the acceleration of the object:

$$a = \frac{v}{t} = \frac{0.4}{2} = 0.2 \text{ m/s}^2.$$

Then, we calculate the distance traveled:

$$x = v_0 t + \frac{1}{2}at^2 = 0 + \frac{1}{2}(0.2)(3^2) = 0.90 \text{ m}.$$