

Fitness Assessment
Sample Test Problems

For each of the problems, round to the following number of decimal places for the computed variables:

Weight in kg: 1 decimal place, i.e. 56.2 kg

Height in meters: 4 decimal places, i.e. 0.1454 meters

VO₂ in ml·kg⁻¹·min⁻¹: 1 decimal place, i.e. 35.3 ml·kg⁻¹·min⁻¹

VO₂ in ml·min⁻¹: 0 decimal place, i.e. 2045 ml·min⁻¹

VO₂ in L·min⁻¹: 3 decimal places, i.e. 3.457 L·min⁻¹

Speed in m·min⁻¹: 1 decimal place, i.e. 95.6 m·min⁻¹

Speed in min·mile⁻¹: 2 decimal places, i.e. 9.65 min·mile⁻¹

Speed in mph: 2 decimal places, i.e. 6.34 mph

Power output in kilogram·meters·min⁻¹: 0 decimal place, i.e. 560 kilogram·meters·min⁻¹

Energy expenditure in kcal·min⁻¹: 2 decimal places, i.e. 8.56 kcal·min⁻¹

Energy expenditure in kcal: 0 decimal places, i.e. 5346 kcal

1. A 110 pound female exercises 3 times per week performing the following routine each exercise session: 15 minutes of walking at 4 mph on a level treadmill followed by 15 minutes of walking at 3 mph and 10% grade followed by 15 minutes of stationary cycling at 600 kgm·min⁻¹. If she exercises in this manner for 1 year (52 weeks) how many total kilocalories will she expend? (39,608 kcal)
2. A male weighing 165 lbs races a 10,000 meter run (6.2 miles) at a constant pace on a flat track in 45 minutes. How many kilocalories will he expend during the race? If he is able to run this distance at an average of 75% of his VO₂max, what is his VO₂max in ml·kg⁻¹·min⁻¹ and in L·min⁻¹? (810 kcals, 64 ml·kg⁻¹·min⁻¹, 4.8 L·min⁻¹)
3. A male weighing 165 lbs runs a marathon (26.2 miles) on a flat course in 2 hours and 45 minutes. How many kilocalories will he expend during the marathon? How far in miles (to the nearest 10th) would this same individual have to walk on a flat course at 4 mph in order to expend the same number of kilocalories as during the marathon? (3378 kcal, 42.3 miles)
4. Joe (weight = 75 kg) normally runs 5 miles on level terrain at an 8 min per mile pace. In order to add a little variety, Joe decides to climb the steps in the UNI Dome. The steps in the UNI DOME are 0.2 meters tall and there are 45 steps in one flight. He climbs up the steps at a rate of 60 steps per minute and he goes down the steps at a rate of 75 steps per minute. How many flights of steps (rounded to the next complete flight) would he need to climb up and down to expend the same number of kilocalories he expends running in one session? (hint: Joe is going up the stairs at a different rate than he is going down) (39)
5. A client (weight = 55kg) has joined your fitness facility and has been pre-tested. Her VO₂max is 35 ml·kg⁻¹·min⁻¹. Your responsibility is to assign her an exercise prescription for two modes of activity, stationary bicycling and jogging. The exercise intensity is to be at **70% of VO₂max**. What would be the appropriate speed of jogging in **minutes per mile** (on the level) and the power output (kgm·min⁻¹) that would be equivalent to **70% of her VO₂max**? (15.3 min·mile⁻¹, 534 kgm·min⁻¹)