**History**

Group indoor cycling has evolved into a fitness phenomenon. Competitive cyclist Johnny Goldberg, popularly known as Johnny G., first created indoor cycling in 1986. While preparing races, he, like other cyclists, contemplated about his need for a form of cycling that would allow him to complete his training no matter what the weather. The answer to his dilemma was in the creation of a stationary bike with a weighted flywheel that remarkably simulated an outdoor bicycle. Goldberg benefited from his invention so much that he began to introduce the approach to his private clients. Goldberg realized that people of all fitness levels with a variety of fitness goals were benefiting from his training program. He partnered with Schwinn?, a prominent American bicycle-manufacturing company, to develop a bike specifically for his Spinning program and the concept of indoor cycling exercise was born. Spinning was introduced to the fitness industry in 1995. One year later, both Keiser and Reebok developed their own programs. Today, indoor cycling is one of the most popular group fitness classes at gyms, recreation centers and health clubs. Globally, there are facilities dedicated solely to indoor cycling. Many people even purchase their own cycling bike for home use. The creation of indoor cycling has revolutionized group fitness around the world.

**References**

ACE Group Fitness Instructor Manual: A Guide for Fitness Professionals. (2007). (2 ed.). United States of America: American Council on Exercise.

Aerobics and Fitness Association of America. Indoor Cycling Workshop Manual. (2005). Sherman Oaks, Ca: Aerobics and Fitness Association of America.

Aerobics and Fitness Association of America. Fitness: Theory & Practice. (2010). Sherman Oaks, Ca: Aerobics and Fitness.

Burke, E. (1995). Serious Cycling. Champaign, Ill.: Human Kinetics.

Goldberg, J. (2003). Spinning Instructor Manual. Venice, Ca: Mad Dogg Athletics.

Group Fitness Specialties. (2007). In D. J. G. Cedric X. Bryant, Christine J. Ekeroth (Ed.), ACE Group Fitness Instructor Manual: A Guide for Fitness Professionals (2 ed., pp. 382-383). United States of America: American Council on Exercise.

Kent, K. A. (2012). Specialty Classes. In G. Desimone (Ed.), ACSM's Resources for the Group Exercise Instructor (pp. 146-150). Baltimore, MD: Lippincott Williams & Wilkins.

**Preparation**

**Bike Set-Up**

There are three adjustments to most indoor cycling bikes � the seat post height, the fore and aft seat positioning and the handlebar height adjustment. Proper positioning of the bike is essential in order to ensure both safety and comfort throughout the duration of the cycling class. It is important to note that each bike is made a little differently so adjustments may vary from bike to bike. Make adjustments in small increments until you find the best position. Be sure that all pop-pins are fully engaged and all knobs are in the locked position before starting a cycle class.

1. Seat Post Height Positioning � First, stand next to the bike and lift the seat to a height that is even with the top of hipbone. When seated on the bike, legs should be fully extended at the bottom of the pedal stroke but knees should never be in a locked-out position.

Common indicators of error in seat post height positioning:

* + Seat too low: inadequate leg extension
  + Seat too high: knees lock out
  + Seat too high: hips may rock in the saddle



1. Fore and Aft Seat Positioning � This positioning is important to achieve a comfortable position, proper breath, upper body relaxation, knee protection and produce an efficient pedal stroke.



Arms should be a comfortable distance from the handlebars with the elbows slightly bent. A good way to measure this is to stand next to the bike and place the elbow at the tip of the front most portion of the seat and then have the fingertip of the middle finger resting on the handlebar. If unable to reach the handlebars, adjust the seat forward. If finger/hand is too far forward on the handlebars, move seat back.



1. Handlebar Height Adjustment �Proper handlebar height ensures a comfortable position on the bike and prevents undue strain on the back. Those new to cycling and individuals with back concerns should initially set up the bike with the handlebars higher than the seat position. As flexibility increases, the handlebars can be adjusted downward to approximately the same height as the tip of the saddle. It is important to note that those who are pregnant should adjust handlebars to a higher position.
2. Pedals - Shoes should be snugly strapped in foot cages or clipped into pedals to prevent feet from coming out during the workout. Shoelaces should be tucked into shoes in order to prevent tangling in the pedals. If toe cages are used, be sure to align the ball of the foot over the center of the pedal. PICTURE 3-4. If cycle shoes are used, be sure to check cleat tension to ensure that cleats are properly aligned. PICTURE 3-5. Improper cleat alignment may cause muscle and tendon strain and may lead to injury over time.

**Recommended equipment**

* Water Bottle: Hydration is essential in indoor cycling classes. The rule of thumb is to drink 1 ounce of water per minute of indoor cycling. Don't wait for the instructor to cue water breaks. Drink frequently throughout the ride.
* Towel: Bring a small towel to wipe excess sweat from skin in order to allow the body to continue to cool itself. To show respect to fellow riders, be sure to wipe your bike down after your workout.
* Footwear: Stiff-soled shoes or cycling shoes with cleats are recommended. Soft-soled shoes such as running shoes absorb too much of the pedal force and makes pedaling inefficient.
* Clothing: Select a workout wardrobe of moisture-wicking fabrics. Consider padded, form-fitting bike shorts to ensure a comfortable ride. These shorts can alleviate soreness in the pelvic and glute region after a ride. Avoid wearing long, baggy pants such as sweat pants as these can get caught in the crank arm of the pedal. Roll such pants up above the knee to minimize said risk.

**Avoidances**

**THESE SHOULD NEVER BE DONE IN AN INDOOR CYCLING CLASS**

1. Using any kind of weighted equipment while on the bike.
2. Riding with one or no hands. Doing this while standing or jumping is dangerous and can cause serious injury. Only ride with one hand while taking a drink of water.
3. Laying the forearms on the handlebars (triathlete style) or isolating one body part. Forcing your body to remain still makes it a magnet for tension. Always strive to keep the energy flowing throughout the body.
4. Riding with pointed toes. This can cause inflammation of the tibial tuberosity, an overuse injury that stresses the knee, ankle and supportive structures. It can also cause numbness in the feet. Pedaling with the ball of the foot, directly, over the center of the pedal, engages the calves, which improves pedal power and efficiency.
5. Ride with no resistance (except during warm-up and cool-down). Riding without resistance is a waste of valuable workout time and at high rpm increases the risk of injury.
6. Pedaling backward. This movement unscrews the pedals from the crank arms, which can lead to injury when the pedals fall off.
7. Dropping the seat in the middle of class. Bike adjustments should remain the same throughout the entire class.
8. Adjusting another rider's resistance during class. Each participant should ride at his or her own pace and level.
9. Hands at the top of the handlebars while seated. This position throws the rider's form out of alignment, which may cause back pain. This position will most often cause you to "lock out" your elbows or use an abnormal reach.
10. Stretching with a leg on the handlebars. Many people are not flexible enough to accomplish this. Instead, use the middle of the frame.

**Bike Maintenance**

In order to provide the most positive indoor cycling environment for all users, it is important for participants to do their part in maintaining and cleaning the bikes.

1. Always wipe bikes clean from top-to-bottom with a towel and cleaning solution or sanitary wipes provided by the facility.
2. Dry the area around the bike.
3. Raise handlebars and seat post to highest positions. This allows for any sweat or other liquids to air-dry, which prevents rusting to the bike.
4. Bring the fore and aft to the backmost position.
5. Discard any empty water bottles, used towels or other trash in the appropriate location.
6. If a bike does not ride properly, be sure to communicate this with your indoor cycling instructor. Give a clear description of the issue so that they or maintenance staff can fix the bike as quickly as possible.

**Fitness Benefits**

Cycling is an excellent cardiorespiratory activity and a good alternative for those who do not like to run or jog, or who have orthopedic limitations to weight-bearing exercise.

**Physical benefits include:**

* Improved cardiorespiratory endurance
* Increased muscular strength
* Increased muscular endurance
* Decrease in body fat and increase in lean body mass
* Effective weight management tool when used in conjunction with a healthy diet

**Psychological benefits include:**

* Stress Relief
* Increase in beta-endorphins
* Enjoyment from participating in a fun, social activity

**Other benefits:**

* Safety, particularly when compared with cycling in the elements. This can lead to a more intense workout since distractions are minimized and participants are more able to focus on heart rate training zones. Also, indoor cycling workouts are more precise because environmental factors are controlled which lend more focus to the training program.
* Personalized workout in a group setting. Participants are able to modify the workout program to suit individual needs by changing resistance, cadence and body position while enjoying the group dynamic of a fitness class.
* Recovery. When working at a lower intensity, riders diminish post-training stiffness and soreness by enhancing venous return and speeding up lactic acid clearance from the muscles.

**Core movements for Indoor Cycling**

* Seated Flat � Most basic movement for Indoor Cycling; helps build strength, stamina and a strong fitness base. Cadence: 80-110 RPM

PICTURE 4-1

* Seated Climb � Challenges your lower body, targeting the glutes and hamstrings for strength, toning and definition. Cadence: 60-80 RPM
* Standing Flat- Upright, standing run performed with light to moderate resistance; uses core muscle groups to stabilize the body, improve leg speed and increase endurance. Cadence: 80-110 RPM

PICTURE 4-2

* Standing Climb � Out�of-the-saddle hill climb used to strengthen and define leg muscles, particularly the quadriceps. Cadence: 60-80RPM PICTURE 4-3
* Jumps - Performed by transitioning in and out of the saddle in a smooth, controlled movement; develops overall strength, timing and balance by shifting muscle utilization from a seated to a standing position. Cadence: 80-110 RPM
* Sprints � An advanced technique in which the rider executes a high-performance effort accompanied by a significant heart rate increase for a short interval followed by a period of recovery. A true sprint lasts no more than 30 seconds. Sprints can be performed on a flat road or in a climb position. Do not sprint in or out of the saddle without resistance. It is very important to focus on breathing during the recovery phase in order to reduce heart rate in preparation for more work. Cadence >110RPM.

**Warm-Up and Cool-Down**

**Warm-Up**

The purpose of a warm-up is to prepare the body for the rigorous cardiorespiratory demands of an indoor cycling class. As the body increases in temperature, blood flow to working muscles increases which allows the body to become more efficient during exercise. Typically for a 60 minute indoor cycling class the warm-up should last about 7 minutes.

Benefits of a warm-up include:

* Increased metabolic rate
* Higher rate of oxygen exchange between blood and muscles
* More oxygen released within muscles
* Increased muscle elasticity
* Reduced risk of abnormal heart rhythms
* Provides opportunity for body to adjust to the biomechanical movements of the workout

**Cool-Down**

The last 10 minutes of any hour-long indoor cycling class should be dedicated to allowing the cardiorespiratory system to gradually recover. Workload and intensity should decrease incrementally during this time. It is important that a rider never stops pedaling and gets off the bike until he/she has taken the time to cool down. Be sure to relax, slow down and put less effort into the ride during the cool down. Once the heart rate has come down to a normal level, participants can then exit the bike and do static stretching.

Benefits of a cool-down include:

* Decreased risk of injury
* Prevents blood pooling in the lower extremities
* Decreased feeling of cramping or stiffness
* Improved flexibility

**Monitoring Intensity**

1. Heart Rate - use a heart rate monitor or estimate by palpitating the carotid artery located in the neck. PICTURE 5-1. Heart rate maximum (MHR) = 220-age. Determine percent intensity needed based on the workout energy zone.

% \* MHR = HR. HR/10 = beats in a 6 second count.

Example: Michelle is 20 years old. 220-20 = 200bpm = MHR. If Michelle needs to be working at 80% capacity, then her target heart rate is 160bpm.

1. Borg's Rate of Perceived Exertion � Perceived exertion is based on how intense exercise feels. The Borg Scale measures intensity based on perceived feelings of fatigue.

|  |  |  |  |
| --- | --- | --- | --- |
| **RPE** | **Description** | **Intensity Level Equivalent** | **Heart Rate Equivalent** |
| 6-8 |  |  | 80 bpm |
| 9 | Very Light |  | 90 bpm |
| 10 |  |  | 100 bpm |
| 11 | Fairly Light |  | 110 bpm |
| 12 |  | 60% MHR | 120 bpm |
| 13 | Somewhat Hard |  | 130 bpm |
| 14 |  | 70% MHR | 140 bpm |
| 15 | Hard |  | 150 bpm |
| 16 |  | 80% MHR | 160 bpm |
| 17 | Very Hard |  | 170 bpm |
| 18 |  | 90% MHR | 180 bpm |
| 19 | Very, very Hard |  | 190 bpm |
| 20 |  |  | 200 bpm |

High heart rates can be easily reached in an indoor cycling class. It is important to keep intensity at a comfortable level. Those who are fit should rate intensities between 12-19. Those new to cycling and unfit individuals should rate intensities between 12 and 15.

1. Cadence Check � A technique that ensures the participants have enough resistance to climb, jump and sprint. Build cadence checks into your rides when a certain resistance is relevant to your training objective.
   * While pedaling, place the palm of right hand over the right knee.
   * Count every time the knee comes up on the pedal stroke and taps the palm (one revolution of the pedals). Do this for 15 seconds and multiply by 4. This is pedal revolution per minute, or cadence.
   * The general guideline for flats is 80-110 rpm (20-25 counts); 60-80rpm (15-20 counts) for hills.

# Work Zones

There are three main work zones for indoor cycling classes. These work zones set the tone for the class and help give a training goal for the day.

1. **Endurance Training** � 65-75% MHR; 60-80 RPM
   * Emphasizes consistent energy usage, while maintaining HR at a specific energy zone
   * Steady in the saddle riding (no standing, jumps, climbs, etc.)
   * Learning cycling efficiency by maintaining a comfortable pace
   * All aerobic, no anaerobic training
   * Increase of aerobic power allowing you to ride for longer periods of time, resisting fatigue

**Benefits:**

* + Develops cardiovascular endurance
  + Develops mind/body connection, awareness of body parts, focusing techniques and most importantly, BREATHING techniques
  + Allows the body to maximize fat burning potential
  + Strengthens hip flexors by riding in the saddle
  + Good class for beginners or deconditioned participants to get the basics down

## Training Variables:

**Breathing Techniques**

* + Diaphragmatic Breathing � This is a deep, three-part breath executed by inhaling through the nose expanding the diaphragm, slowly lifting the rib cage and chest, finally becoming complete with a long, slow exhale through the mouth.
  + Ujjayi Breathing � Inhale through nose, exhale slowly through the nose engaging the abdomen, engage abdomen on exhale, creating a slight noise. This breath is commonly used in yoga practice.

**Focusing Techniques** � awareness of body parts or individual muscle groups

* + Focus on right foot, move to left, etc.
  + Think about "wiping" foot at bottom of each pedal stroke
  + Think about relaxing the hands, neck, shoulders, abdominals, etc.

**Guided Relaxation** � tense and relax muscles on demand

* + Tense shoulders, and then relax shoulders
  + Straighten arms and ride, now relax back down, drop shoulders

**Counting** � each pedal stroke with each breath

1. **Interval Training** � 65-90% MHR, Emphasizes speed, tempo, timing and rhythm; RPM � never above 120; high intensity drills with recovery periods; acceleration drills/recovery drills

## Benefits:

* + Improves aerobic and anaerobic capacity by developing the ability to quickly recover from intense bouts of exercise
  + Enhances cardiorespiratory endurance
  + Improves resistance to fatigue
  + Increases VO2 max
  + Builds mental strength by teaching riders to anticipate and excel under periods of stress

## Training Variables:

**Aerobic Interval** � purpose to build up aerobic base

* + 75-85% MHR
  + Below "race pace"

**Aerobic/Anaerobic** (i.e., 2-3 min aerobic, 1 min anaerobic)

* + 85-100% MHR
  + Race Pace

**Anaerobic** � purpose is to increase muscle buffering capacity and leg strength

* + 90-100% MHR
  + Increase ability to clear lactate
  + Increase strength
  + SPRINTING IS UNSUITABLE FOR BEGINNING RIDERS

### Work to Rest Ratios:

|  |  |
| --- | --- |
| **Work** | **Rest** |
| 1-3 min | 1-3 min |
| 3-5 min | 75% interval time |
| 5-10 min | 50% time |

I.e.,

* + Hill Repeats � build muscular endurance for climbs
  + Flat Repeats � build leg speed
  + Standing Sprints � build leg speed
  + Cadence Building � movement stays same as leg speed increases over a period of time

1. **Strength Training** - 75-85% MHR. 70-80 RPM; Focuses on mind/body connection and muscle repair; Similar to endurance but with heavier resistance

### Benefits:

* + Increased muscular strength, muscle tone and hypertrophy
  + Increases ability to accelerate
  + Relaxation and energy accumulation
  + Mind/body awareness during exercise stress

**Training Variables:**

* + Breathing Techniques
  + Focusing Techniques
  + Guided Relaxation
  + Cadence Checking

**Work Zones**

There are three main work zones for indoor cycling classes. These work zones set the tone for the class and help give a training goal for the day.

1. Endurance Training � 65-75% MHR; 60-80 RPM
   * Emphasizes consistent energy usage, while maintaining HR at a specific energy zone
   * Steady in the saddle riding (no standing, jumps, climbs, etc.)
   * Learning cycling efficiency by maintaining a comfortable pace
   * All aerobic, no anaerobic training
   * Increase of aerobic power allowing you to ride for longer periods of time, resisting fatigue

Benefits:

* + Develops cardiovascular endurance
  + Develops mind/body connection, awareness of body parts, focusing techniques and most importantly, BREATHING techniques
  + Allows the body to maximize fat burning potential
  + Strengthens hip flexors by riding in the saddle
  + Good class for beginners or deconditioned participants to get the basics down

Training Variables: a. Breathing Techniques ? Diaphragmatic Breathing � This is a deep, three-part breath executed by inhaling through the nose expanding the diaphragm, slowly lifting the rib cage and chest, finally becoming complete with a long, slow exhale through the mouth.? Ujjayi Breathing � Inhale through nose, exhale slowly through the nose engaging the abdomen, engage abdomen on exhale, creating a slight noise. This breath is commonly used in yoga practice. b. Focusing Techniques � awareness of body parts or individual muscle groups? Focus on right foot, move to left, etc. ? Think about "wiping" foot at bottom of each pedal stroke? Think about relaxing the hands, neck, shoulders, abdominals, etc.c. Guided Relaxation � tense and relax muscles on demand? Tense shoulders, and then relax shoulders? Straighten arms & ride, now relax back down, drop shouldersd. Counting � each pedal stroke with each breath 2. Interval Training � 65-90% MHR, Emphasizes speed, tempo, timing and rhythm; RPM � never above 120; high intensity drills with recovery periods; acceleration drills/recovery drillsBenefits: - Improves aerobic and anaerobic capacity by developing the ability to quickly recover from intense bouts of exercise- Enhances cardiorespiratory endurance- Improves resistance to fatigue - Increases VO2 max- Builds mental strength by teaching riders to anticipate�and excel�under periods of stress Training Variables: a. Aerobic Interval � purpose to build up aerobic base 75-85% MHR Below "race pace"b. Aerobic/Anaerobic (i.e., 2-3 min aerobic, 1 min anaerobic) 85-100% MHR Race Pacec. Anaerobic � purpose is to increase muscle buffering capacity and leg strength 90-100% MHR Increase ability to clear lactate Increase strength \* SPRINTING IS UNSUITABLE FOR BEGINNING RIDERSWork to Rest Ratios:Work Rest1-3 min 1-3 min3-5 min 75% interval time5-10 min 50% time I.e., Hill Repeats � build muscular endurance for climbs Flat Repeats � build leg speed Standing Sprints � build leg speed Cadence Building � movement stays same as leg speed increases over a period of time 3. Strength Training - 75-85% MHR. 70-80 RPM; Focuses on mind/body connection and muscle repair; Similar to endurance but with heavier resistanceBenefits: - Increased muscular strength, muscle tone and hypertrophy - Increases ability to accelerate - Relaxation and energy accumulation- Mind/body awareness during exercise stressTraining Variables: a. Breathing Techniquesb. Focusing Techniques c. Guided Relaxation d. Cadence Checking

|  |  |  |
| --- | --- | --- |
| **Cycling - Assessment** |  |  |

**1. The following is not a benefit of an indoor cycling class:**

a. Indoor cycling is safer than training in the elements and provides a more consistent and regimented workout.

b. Participants are able to modify the workout program to suit their needs by changing resistance, cadence and body position while maintaining the group dynamic of a fitness class.

c. Indoor cycling increases cardiorespiratory endurance, muscular strength and muscular endurance.

**d. Participants learn proper bike maintenance including changing a tire, lubricating a chain and replacing pedal straps.** *(answer)*

**2. Which of the following are ways that intensity can be monitored in an indoor cycling class?**

a. BORG Rate of Perceived Exertion Scale

b. Heart rate monitoring

c. Cadence checks

d. None of the above

**e. All of the above** *(answer)*

**4. If the seat post height is adjusted too low, the participant may be experiencing:**

a. Inadequate leg extension

b. Unnecessary strain on the knee joint

c. Hips rocking in the saddle

**d. A & B** *(answer)*

e. B & C

**5. True or False. It is best to perform sprints with no resistance on the bike in order to achieve maximum speed.**

a. True

**b. False** *(answer)*

**6. The formula to calculate heart rate maximum is:**

a. MHR = 200 – age

b. MHR = 200 + age

**c. MHR = 220 – age** *(answer)*

d. MHR = 220 + age

**7. When leaving a cycling studio, it is important to:**

a. Raise handlebars and seat post to maximum height.

b. Always wipe bikes clean from top-to-bottom with either a towel and cleaning solution or sanitary wipes.

c. Dry the area around the bike.

d. Bring the fore and aft to the backmost position.

**e. All of the above** *(answer)*

**8. The strength training work zone uses what type of resistance?**

**a. Heavy** *(answer)*

b. Moderate

c. Light

d. None

**9. A characteristic of endurance training ride is:**

a. Frequent standing climbs

b. Improves aerobic and anaerobic capacity by developing the ability to quickly recover from intense bouts of exercise

**c. Increases aerobic power by allowing to ride for longer periods of time** *(answer)*

d. RPM of 70-80

**10. Examples of interval training include:**

a. Hill repeats

b. Flat repeats

c. Standing sprints

d. Cadence building

**e. All of the above** *(answer)*

**11. Interval training:**

**a. Improves aerobic and anaerobic capacity by developing the ability to quickly recover from large bouts of exercise** *(answer)*

b. Decreases VO2 max

c. Is the best work zone to use relaxation techniques

d. Uses protein as the main fuel source

**12. This core movement is the most basic movement in an indoor cycling class.**

a. Jumps

b. Seated Climb

c. Standing Climb

**d. Seated Flat** *(answer)*

e. Standing Flat

**14. In a 60-minute indoor cycling class, the cool-down portion of the workout should last:**

a. 5 minutes

b. 7 minutes

**c. 10 minutes** *(answer)*

d. 12 minutes

**15. Which of the following are considered contraindicated movements and should never be performed during an indoor cycling class?**

a. Pedaling backwards

b. Using resistance equipment while riding.

c. Pedaling with pointed toes

d. Riding with one or no hands

**e. All of the above** *(answer)*

**16. Those who experience chest pain, dizziness or light-headedness during exercise should:**

**a. Consult a physician** *(answer)*

b. Eat a banana

c. Decrease resistance

d. Do more chest stretching

**17. Cycling is:**

a. An excellent strength training exercise

b. A high impact exercise

**c. A low-impact cardiorespiratory exercise** *(answer)*

**18. Which of the following is not a tip for setting up an indoor cycling bike?**

a. Secure all pop-pins.

**b. Arms should lock out when the fore and aft is adjusted properly.** *(answer)*

c. When leg is fully extended, a slight bend should remain in the knee.

d. Ball of foot should be in the center of the foot cage.

**19. Who is credited for creating indoor cycling?**

a. Lance Armstrong

**b. Johnny Goldberg** *(answer)*

c. Floyd Landis

**20. Pedaling with the ball of the foot over the center of the pedal directly engages which muscle group:**

a. Hamstrings

b. Shins

**c. Calves** *(answer)*

d. Inner thighs

**21. The purpose of the warm-up is to:**

a. Burn calories

b. Prevent blood pooling in the lower extremities

c. Lower blood pressure before strenuous exercise begins

**d. Prepare the body for the more rigorous cardiorespiratory demands of the indoor cycling class** *(answer)*

**22. A standing climb is:**

**a. An out–of-the-saddle hill position used to strengthen and define leg muscles particularly the quadriceps** *(answer)*

b. Challenges your lower body, targeting the glutes and hamstrings for strength, toning and definition

c. Performed by transitioning in and out of the saddle in a smooth, controlled movement

**23. Training variables that affect endurance rides are:**

a. Cadence checking, counting and focusing techniques

**b. Breathing techniques, guided relaxation and counting** *(answer)*

c. Breathing techniques, focusing techniques and meditation

**24. True or False. To do a cadence check, you should count every time the knee comes up on the pedal stroke and taps the palm for 15 seconds and multiply by 4.**

**a. True** *(answer)*

b. False

**25. The recommended heart rate zone for an interval ride is what percent of heart rate maximum?**

a. 70-90%

b. 70-85%

**c. 65-90%** *(answer)*

d. 65-85%

e. 60-90%