

Directions: Show as much detail as possible for partial credit. Use proper mathematical notation. Make explanations short but accurate. Place final answers in a box and be sure your presentation is in a clear, logical format. You may use your calculators.

1)[10] Assume you can exert a force F of 10 N.

(a)[5] If your force is the only force acting on a 15.5 kg cat, what is the cat's acceleration?

Solution

Newton's second law tells us that

$$F = ma. \tag{1}$$

$$a = \frac{F}{m} = \frac{10 \text{ N}}{15.5 \text{ kg}} = 0.65 \frac{\text{m}}{\text{s}^2} \tag{2}$$

(b)[5] If the cat is at rest when you start pushing and you push for 37 s in a constant direction, what will be the cat's speed at that time?

Solution

Acceleration changes velocity.

$$v = v_0 + at \tag{3}$$

$$v = 0 \frac{\text{m}}{\text{s}} + \left(0.645161 \frac{\text{m}}{\text{s}^2} \right) (37 \text{ s}) = 24 \frac{\text{m}}{\text{s}} \tag{4}$$

Test 8 Ch 5 - AP Calculus BC - Dr. Horner - 2010-2011 NAME

ALL WORK MUST BE YOUR OWN. YOU MAY USE **YOUR** TEXT, **YOUR** NOTES AND YOUR CALCULATOR, BUT NOT ANY OTHER MATERIALS NOR MAY YOU DISCUSS (in any form) THESE QUESTIONS OR ANY MATHEMATICS WITH ANYONE ELSE. THE CONSEQUENCES OF ANY VIOLATION OF THIS TRUST ARE SEVERE. I fully understand the above statement and have complied with all it states:

Sign Here _____

PAPERS ARE DUE BY 8:10AM NEXT SCHOOL DAY IN ROOM 119 OR TO XXX.

Email me if you feel you need clarification of any questions.