Sample Math Problems

Here are some sample math problems, numbered 41-50, of the kind that could be on the exam. In fact, four or five problems will be chosen at random and modified for the second hour exam. So, if you can do all of the following, you will be ready.

41. Suppose that a pendulum is initially displaced 1 foot from its central position, and that on each successive swing its displacement at the apex is three-fifths of the displacement at the preceding apex. Then the total distance traveled by the pendulum is (in feet):

    A. 5/3 B. 5/2 C. 5 D. infinite E. None of these.

42. Suppose an object is dropped from rest vertically off a cliff that is 49 feet high. When (in seconds t) does the object hit the ground? Answer: t equals:

    A. 5/4 B. 7/4 C. 9/4 D. 3/2 E. None of these.

43. A ball is thrown upward off the edge of a vertical cliff. Its height above the ground t seconds after it is thrown up is given by $s(t) = -t^2 + 2t + 32$ (in feet). Then the height of the cliff (in feet) is:

    A. 2 B. 8 C. 16 D. 32 E. None of these.

44. In the previous problem, if the velocity is $v(t) = -2t + 2$ feet per second, how high (in feet) does the ball go above the ground?

    A. 15 B. 16 C. 32 D. 33 E. None of these.

45. Suppose an object is dropped from rest vertically from a cliff. Then the average acceleration (in feet per second per second) over the interval of time from 5 to 5.1 seconds is:

    A. 9.8 B. 16 C. 32 D. $16\dfrac{5.1^2 - 5^2}{.1}$ E. None of these.

46. Simplify the expression $\dfrac{(2+h)^2 - 2^2}{h}$:

    A. $4h + h^2$ B. $4 + h$ C. h D. $4h$ E. None of these.

47. As $h \to 0$, the quotient $\dfrac{32(5+h)-32(5)}{h}$ approaches the limit (real number):

A. 5 B. $\dfrac{0}{0}$ C. 25 D. infinity E. None of these.

48. The slope of the line through the points (3, 4) and (1, 1) is:

A. 4/5 B. 2/3 C. 5/4 D. 3/2 E. None of these.

49. An equation of the line through the point (1, 2) with slope 2 is:

A. $y = 0$ B. $y = x + 2$ C. $y = 2x$ D. $y = x$ E. None of these.

50. The distance between the points (0, 0) and $\left(\sqrt{2}, \sqrt{2}\right)$ is:

A. 1 B. $\sqrt{2}$ C. $\sqrt{3}$ D. 2 E. None of these.

[Answers: 41-C, 42-B, 43-D, 44-D, 45-C, 46-B, 47-E, 48-D, 49-C, 50-D]