4.1 PRE-TEST

Course name: Calculus Calculus I Essential Skills
Professor name: Homeschool Studies
College name: Homeschool Studies
Course code:
Section code:

Directions: Ready to test your smarts?

Have a shot at this 15-question practice test!

Take it as many times as you want to. Once you're done, be sure to click the "Guide" button to review any questions you missed, a step-by-step explanation for the question, and a link to the video where that content is discussed.

Need Help? No Problem! Contact support@thinkwell.com with questions.

Question: 1   QID: 15149

Given that a particular moving object's velocity is given by the equation $v(t) = 65t - 2t^2$, what is the equation for the object's acceleration?

- ○ $a(t) = 65 + 4t$
- ○ $a(t) = 65$
- ○ $a(t) = 65 - 4t$
- ○ $a(t) = 61$

Question: 2   QID: 15152

Given that a particular moving object's position is given by the equation $p(t) = -32t^2 + 110$, what is the equation for the object's acceleration?

- ○ $a(t) = 64t$
- ○ $a(t) = -64t$
- ○ $a(t) = 64$
- ○ $a(t) = -64$

Question: 3   QID: 11849

The alien Shaxxxt is flying around the solar system in his new Insight Driven Flying Saucer. The saucer starts off pretty slow, but it picks up speed quickly.

The position function for the saucer in miles is $P(t) = 2e^{2t}$ where t is in minutes. What is Shaxxxt's velocity when $t = 6$?

- ○ 325509.58 miles per minute
- ○ 651019.17 miles per minute
- ○ 651019.17 miles per hour
- ○ 3 astronomical units per day

Question: 4   QID: 11860

$x^2 + y^2 = 9$. Find $\dfrac{d^2y}{dx^2}$.

   ○ $\dfrac{d^2y}{dx^2} = \dfrac{-x}{y}$

   ○ $\dfrac{d^2y}{dx^2} = -\dfrac{9}{y^3}$

   ○ $\dfrac{d^2y}{dx^2} = -1$

   ○   None of the above

Question: 5   QID: 11878

Use the linear approximation formula to approximate $\sqrt{15.9}$.

   ○ $\sqrt{15.9} \approx \dfrac{319}{80}$

   ○ $\sqrt{15.9} \approx 4$

   ○ $\sqrt{15.9} \approx \dfrac{321}{80}$

   ○ $\sqrt{15.9} \approx 3.9874804$

Question: 6   QID: 20672

Complete two interations of Newton's method for the given function and indicated initial guess.
$f(x) = x^2 - 7, \ x_1 = 3$

Which of the following is equal to x_3?

   ○   127/48

   ○   129/48

   ○   10/3

   ○   8/3

Question: 7   QID: 11880

Suppose that the costs for a small trucking company are given by the function

$C(d) = 30 + 2d + \dfrac{72}{d}$,

where d is the number of trucks used. How many trucks should the company use in order to minimize costs?

   ○   6 trucks

   ○   12 trucks

   ○   36 trucks

   ○   There is no solution.

Question: 8   QID: 11891

A farmer needs a new pen for some of his livestock and decides to build a rectangular fence. The farmer has 60 feet of fence. What is the greatest area the farmer could enclose?

- ○ 0 feet ^{2}
- ○ 300 feet ^{2}
- ○ 200 feet ^{2}
- ○ 225 feet ^{2}

Question: 9   QID: 11899

A man is constructing an open-faced box from a rectangular sheet of metal. To do so, he cuts 4 equal sized squares from the corners of the sheet and then folds the remaining metal upwards to create the sides of a box. What is the maximum possible volume that he could hold with an 18 × 14 inch sheet of metal?

- ○ 59.02 cubic inches
- ○ 112.42 cubic inches
- ○ 252.00 cubic inches
- ○ 292.86 cubic inches

Question: 10   QID: 11904

The average soda can is made up of 15.625π square inches of material. What dimensions (to the nearest hundredth) would maximize the volume of this cylindrical can?

- ○ $r = 1.25$ inches
  $h = 5$ inches
- ○ $r = 3.23$ inches
  $h = 1.61$ inches
- ○ $r = 5$ inches
  $h = 1.25$ inches
- ○ $r = 1.61$ inches
  $h = 3.23$ inches

Question: 11   QID: 15180

A 16 inch wire is cut in two and shaped into two squares. What is the minimum possible sum of the two areas?

- ○ $A_{sum} = 16$ in^2
- ○ $A_{sum} = 8$ in^2
- ○ $A_{sum} = 4$ in^2
- ○ $A_{sum} = 0$ in^2

Question: 12   QID: 15200

A pebble is dropped into a pool of water, generating circular ripples. The radius of the largest ripple is increasing at a constant rate of 3 inches per second. By how many inches did the circumference of the ripple increase between 0 and 2 seconds?

- ○ 12π in.
- ○ 6π in.
- ○ 2π in.
- ○ 3π in.

Question: 13 QID: 15201

A 10 ft ladder is being pulled away from a wall at a rate of 3 ft/sec. What is the rate of change in the area beneath the ladder when the ladder is 6 ft from the wall?

- ○ $\dfrac{dA}{dt} = 0$ ft^2/ sec
- ○ $\dfrac{dA}{dt} = \dfrac{9}{4}$ ft^2/ sec
- ○ $\dfrac{dA}{dt} = \dfrac{21}{4}$ ft^2/ sec
- ○ $\dfrac{dA}{dt} = \dfrac{65}{8}$ ft^2/ sec

Question: 14 QID: 15203

Two cars leave an intersection at the same time, one headed west and the other north. The westbound car is moving at 40 mph and the northbound car is moving at 50 mph. Fifteen minutes later, what is the rate of change in the perimeter of the right triangle created using the two cars and the intersection?

- ○ 64.02 mph
- ○ 90.00 mph
- ○ 134.50 mph
- ○ 154.02 mph

Question: 15 QID: 27936

A baseball diamond has the shape of a square with sides 90 feet long. A player is running from second to third at a speed of 28 ft /sec. At the time he is 30 feet from third, what is the rate of change of his distance from the home plate?

- ○ $-\dfrac{28}{\sqrt{10}}$ ft/ sec
- ○ $-\dfrac{280}{\sqrt{10}}$ ft/ sec
- ○ $\dfrac{107}{\sqrt{10}}$ ft/ sec
- ○ -28 ft /sec