CALCULUS 2 - FALL 25 - EXAM 1A - Solutions

No references. Each question worth two points. Total 50 points = half of Exam 1. True or false:

F 1) If $f(x) \leq g(x)$ on $[a,b]$, then the area between the curves could be written $\int_a^b (f(x) - g(x))dx$ negative area

F 2) For the disk method of determining volume of a figure of revolution about the x-axis $dV = \pi[f(x)]^2 dy$ dx

F 3) For the washer method of determining volume of a figure of revolution about the x-axis $dV = \pi([f(x)] - [g(x)])^2 dx$ $[f(x)]^2 - [g(x)]^2$

F 4) Rolling a marble across a horizontal frictionless table results in positive work

F 5) For the shell method of determining volume of a figure of revolution about the x-axis $dV = 2\pi f(x)dx$ need height of shell

T 6) The formula for differential surface area of a figure of revolution about the x-axis could be $dA = 2\pi y\sqrt{1 + \left(\frac{dy}{dx}\right)^2}\, dx$

F 7) Climbing up a ladder results in gravity doing positive work

T 8) The volume of the figure of revolution generated by $y = f(x)$ from $x = a$ to $x = b$ could be $\pi \int_a^b [f(x)]^2 dx$

T 9) The metric unit for moment is newton-meter

F 10) Work done on a spring with spring constant k being stretched x units over neutral length is kx^2 $\frac{1}{2}$

F 11) Force equals pressure times length volume

F 12) Pressure due to a fluid with mass density ρ at depth x would be ρx $\rho g x$

F 13) The volume of the surface of revolution generated by $y = f(x)$ from $x = a$ to $x = b$ could be $2\pi \int_a^b f(x)dx$

T 14) The weighted average of $f(x)$ over the interval $[a,b]$ is $\frac{1}{b-a}\int_a^b f(x)dx$

T 15) The centroid of a planar figure always lies on an axis of symmetry

F 16) The centroid of a thin plate depends on its density centroid is independent of mass

T 17) The center of gravity and centroid of a thin plate are the same if the density of the plate material is constant

T 18) The center of mass and the center of gravity of a thin plate are always the same

F 19) The center of gravity of a thin plate is always located on the plate washer

F 20) The total force on one side of a submerged thin plate is the plate area times the pressure at the centroid perpendicular

T 21) A thin plate could be balanced by applying a force equal to its weight at its center of gravity

T 22) Pressure in a liquid at a given depth is the same in all directions

T 23) Pressure in a fluid at depth x is the weight of a column of fluid with constant cross-section A and height x divided by A

T 24) Pappus' Volume Formula involves the distance travelled by the centroid of a cross section

T 25) The elastic potential energy given to a spring by stretching it a distance x from its unstretched length is the same as compressing it the same distance