This print-out should have 6 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

CalC3e06a
001 10.0 points

Find the derivative of f when

$$f(x) = 3\tan(x) + 4\cot(x)\,.$$

1. $f'(x) = \dfrac{3 - 7\cos(x)}{\sin(x)\cos(x)}$

2. $f'(x) = \dfrac{3 + 7\cos^2(x)}{\sin^2(x)\cos^2(x)}$

3. $f'(x) = \dfrac{3 + 7\sin^2(x)}{\sin^2(x)\cos^2(x)}$

4. $f'(x) = \dfrac{3 - 7\sin^2(x)}{\sin^2(x)\cos^2(x)}$

5. $f'(x) = \dfrac{3 - 7\cos^2(x)}{\sin^2(x)\cos^2(x)}$

6. $f'(x) = \dfrac{3 + 7\cos(x)}{\sin(x)\cos(x)}$

CalC3e05a
002 10.0 points

Find the derivative of

$$f(x) = x^2\sin(x) + 2x\cos(x)\,.$$

1. $f'(x) = (2 - x^2)\sin(x)$

2. $f'(x) = (2 - x^2)\cos(x)$

3. $f'(x) = (x^2 - 2)\sin(x)$

4. $f'(x) = (x^2 - 2)\cos(x)$

5. $f'(x) = (2 + x^2)\sin(x)$

6. $f'(x) = (x^2 + 2)\cos(x)$

CalC3e33s
003 10.0 points

A ladder 30 feet long rests against a vertical wall. Let θ be the angle between the top of the ladder and the wall and let x be the distance from the bottom of the ladder to the wall.

If the bottom of the ladder slides away from the wall, how fast does x change with respect to θ when $\theta = \pi/3$?

1. 17 ft/rad

2. 14 ft/rad

3. 16 ft/rad

4. 13 ft/rad

5. 15 ft/rad

CalC3e09a
004 10.0 points

Find the derivative of f when

$$f(x) = \frac{\cos x}{\sin x - 1}\,.$$

1. $f'(x) = \dfrac{1}{\cos x + 1}$

2. $f'(x) = \dfrac{1}{1 + \sin x}$

3. $f'(x) = -\dfrac{1}{\sin x + 1}$

4. $f'(x) = \dfrac{1}{1 - \cos x}$

5. $f'(x) = \dfrac{1}{\sin x - 1}$

6. $f'(x) = -\dfrac{1}{1 + \cos x}$

7. $f'(x) = \dfrac{1}{1 - \sin x}$

8. $f'(x) = \dfrac{1}{\cos x - 1}$

TrigDeriv12b

005 10.0 points

Find the derivative of

$$f(x) = \frac{\tan x - \sec x}{x^3}\,.$$

1. $f'(x) = -\dfrac{(x\sec x + 3)(\tan x + \sec x)}{x^4}$

2. $f'(x) = \dfrac{(x\sec x - 3)(\tan x - \sec x)}{x^4}$

3. $f'(x) = -\dfrac{(x\sec x + 3)(\tan x - \sec x)}{x^4}$

4. $f'(x) = -\dfrac{(x\sec x - 3)(\tan x + \sec x)}{x^4}$

5. $f'(x) = \dfrac{(x\sec x - 3)(\tan x + \sec x)}{x^4}$

6. $f'(x) = \dfrac{(x\sec x + 3)(\tan x - \sec x)}{x^4}$

CalC3c64exam

006 10.0 points

If f is a differentiable function, express the value of

$$\lim_{x\to 2} \frac{xf(x) - 2f(2)}{x - 2}$$

in terms of f and f'.

1. limit $= f'(2) + f(2)$

2. limit does not exist

3. limit $= f'(2) - f(2)$

4. limit $= 2f'(2) - f(2)$

5. limit $= 2f'(2) + f(2)$

6. limit $= f'(2)$