Marks: 1

Determine where the given function is increasing and where it is decreasing  
  
[\displaystyle f(x)=x^3-12x-1](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%5Cdisplaystyle+f%28x%29%3Dx%5E3-12x-1)

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. Increasing on [(-\infty, -2)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-%5Cinfty%2C+-2%29)and [(2,\infty)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%282%2C%5Cinfty%29), decreasing on [(-2,2)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-2%2C2%29) |  |
|  | b. Decreasing on [(-\infty, -2)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-%5Cinfty%2C+-2%29)and [(2,\infty)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%282%2C%5Cinfty%29), increasing on [(-2,2)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-2%2C2%29) |  |
|  | c. Decreasing on [(-\infty, -4)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-%5Cinfty%2C+-4%29)and [(4,\infty)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%284%2C%5Cinfty%29), increasing on [(-2,2)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-2%2C2%29) |  |
|  | d. Increasing on [(-\infty, -4)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-%5Cinfty%2C+-4%29)and [(4,\infty)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%284%2C%5Cinfty%29), decreasing on [(-4,4)](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?%28-4%2C4%29) |  |
|  | e. None of the other choices is correct |  |

Question 2

Marks: 1

Find the value or values of c that satisfy the equation in the conclusion of the Mean Value Theorem for the function f(x) = x + 96/x , and interval [6, 16].

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 6, 16 |  |
|  | b. 0, [4\sqrt{6}](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?4%5Csqrt%7B6%7D) |  |
|  | c. [-4\sqrt{6}, 4\sqrt{6}](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?-4%5Csqrt%7B6%7D%2C+4%5Csqrt%7B6%7D) |  |
|  | d. [4\sqrt{6}](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?4%5Csqrt%7B6%7D) |  |

Question 3

Marks: 1

Find the point on the line y = 10x + 9 that is closest to the origin.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. (-90/101, 11/101) |  |
|  | b. (-90/101, 9/101) |  |
|  | c. (-90/101, 9/100) |  |
|  | d. (90/101, -9/101) |  |
|  | e. (-89/101, 9/101) |  |

Question 4

Marks: 1

A particle is moving with the given data. Find the position of the particle.  
  
v(t) = sin(t)-cos(t), s(0)=0

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. 1+cos(t)-sin(t) |  |
|  | b. 1-cos(t)+sin(t) |  |
|  | c. 1-cos(t)-sin(t) |  |
|  | d. -cos(t)-sin(t) |  |
|  | e. 17-cos(t)-sin(t) |  |

Question 5

Marks: 1

Using Newton's methods with the initial approximation [ x_1=0](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?+x_1%3D0), find [ x_3](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?+x_3), the third approximation to a root of the equation [x^2-2x=1](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?x%5E2-2x%3D1). Round your answer to 4 decimal places.

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. -0.4167 |  |
|  | b. -0.4325 |  |
|  | c. None of the other choices is correct |  |
|  | d. -0.4058 |  |
|  | e. -0.4423 |  |

Question 6

Marks: 1

Find the maximum or minimum point(s) of the function.  
  
[F(x)=(1-x^2)^2+6x^2](http://cms.fpt.edu.vn/elearning/filter/tex/displaytex.php?F%28x%29%3D%281-x%5E2%29%5E2%2B6x%5E2)

Choose one answer.

|  |  |  |
| --- | --- | --- |
|  | a. (8, 0) |  |
|  | b. (-8, 2) |  |
|  | c. (16, 1) |  |
|  | d. (0, 1) |  |
|  | e. (-8.6, 6) |  |