Question 1

QUESTION 9

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Technology Free
2020

The scores on a test are assumed to be normally distributed.

Researchers use the results from a random sample of scores to calculate a confidence interval for the population mean. However, a shorter confidence interval width is required so the researchers decide to use a second sample for their calculations.

Assuming that the standard deviations for both samples are the same, the researchers can ensure that a shorter confidence interval width is produced by

(A) decreasing the sample size and decreasing the confidence level.

(B) decreasing the sample size and increasing the confidence level.

(C) increasing the sample size and decreasing the confidence level.

(D) increasing the sample size and increasing the confidence level.

Question 2

QUESTION 1

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Which of the following is a population parameter?

(A) s

(B) μ

(C) $\bar{x}$

(D) z

Question 3

QUESTION 7

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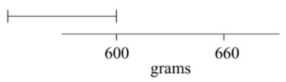
2021

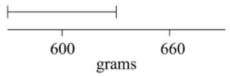
The mass of a particular variety of cake is claimed to be normally distributed with a mean of 660 grams. A random sample of five of these cakes is found to have a mean mass of 600 grams.

Which option represents an approximate confidence interval for μ based on this sample?

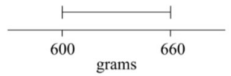
(A)



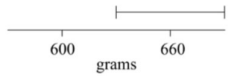
(B)



(C)



(D)



Question 4

QUESTION 14 (4 marks)

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The motion of an object that moves in a straight line is given by $v(x) = \cos^{-1}(2x)$ where v is the velocity (m s^{-1}) and x is the displacement (m) from the origin.

a) Determine $a(x)$ where a is the acceleration (m s^{-2}) of the object. *[2 marks]*

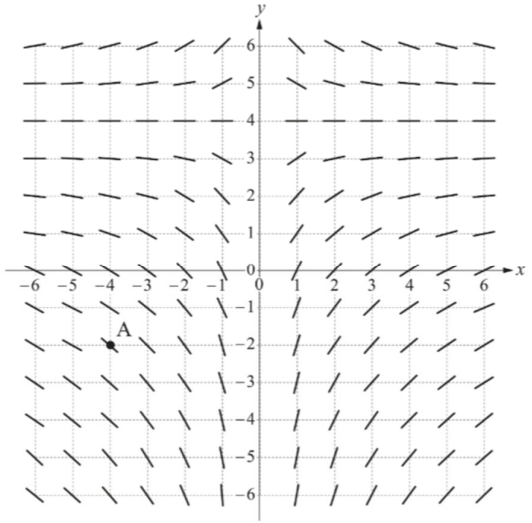
b) Use the result from 14a) to determine $a(0)$, given $-2\pi \le a(0) \le 0$. Express your answer in simplest form. *[2 marks]*

Question 5

QUESTION 14 (4 marks)

Simple Familiar
Technology Free
2022

The slope field for the differential equation $\frac{dy}{dx} = \frac{-0.5(y-4)}{x}$, $x \neq 0$ using $-6 \le x \le 6$ and $-6 \le y \le 6$ is shown.



a) Determine the value of the slope at point A. *[2 marks]*

b) Use the slope field to sketch the solution curve for $\frac{dy}{dx} = \frac{-0.5(y-4)}{x}$ given that when $x = -6$, $y = 3.5$ *[2 marks]*

Question 6

QUESTION 17 (7 marks)

Complex Familiar
Technology Free
2021

The area between the graphs of the functions $y = 4x$ and $y = 2x^2$ is rotated about the y-axis to form a solid of revolution with a volume of V units^3.

Determine the exact value of V.