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PRM Certification - Exam II: Mathematical Foundations of Risk Measurement

PRMIA 8002

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QUESTION NO: 1

What is the angle between the following two three dimensional vectors: a=(1,2,3), b=(-4,2,0)?

A. 90 degrees

B. 180 degrees

C. 57 degrees

D. 45 degrees

ANSWER: A

QUESTION NO: 2

Let a, b and c be real numbers. Which of the following statements is true?

A. The commutativity of multiplication is defined by

B. The existence of negatives is defined by

C. The distributivity of multiplication is defined by

D. The associativity of multiplication is defined by

ANSWER: C

QUESTION NO: 3

Let X be a random variable distributed normally with mean 0 and standard deviation 1. What is the expected value of exp(X)?

A. E(exp(X)) = 1.6487

B. E(exp(X)) = 1

C. E(exp(X)) = 2.7183

D. E(exp(X)) = 0.6065

ANSWER: A

QUESTION NO: 4

Identify the type and common element (that is, common ratio or common difference) of the following sequence: 6, 12, 24

A. arithmetic sequence, common difference 2

B. arithmetic sequence, common ratio 2

C. geometric sequence, common ratio 2

D. geometric sequence, common ratio 3

ANSWER: C

QUESTION NO: 5

What is the total derivative of the function f(x,y) = ln(x+y), where ln() denotes the natural logarithmic function?

A. 1 / (x+y)

B. (Δx + Δy) / (x+y)

C. -Δx/(x+y) - Δy/(x+y)

D. ln(x+y) Δx + ln(x+y) Δy

ANSWER: B

QUESTION NO: 6

A 2-step binomial tree is used to value an American put option with strike 105, given that the underlying price is currently 100. At each step the underlying price can move up by 10 or down by 10 and the risk-neutral probability of an up move is 0.6. There are no dividends paid on the underlying and the continuously compounded risk free interest rate over each time step is 1%. What is the value of the option in this model?

A. 7.12

B. 6.59

C. 7.44

D. 7.29

ANSWER: A

QUESTION NO: 7

I have a portfolio of two stocks. The weights are 60% and 40% respectively, the volatilities are both 20%, while the correlation of returns is 50%. The volatility of my portfolio is

A. 16%

B. 17.4%

C. 20%

D. 24.4%

ANSWER: B

QUESTION NO: 8

A typical leptokurtotic distribution can be described as a distribution that is relative to a normal distribution

A. peaked and thin at the center and with heavy (fat) tails

B. peaked and thin at the center and with thin tails

C. flat and thick at the center and with heavy (fat) tails

D. flat and thick at the center and with thin tails

ANSWER: A

QUESTION NO: 9

Let f(x) = c for x in [0,4] and 0 for other values of x.

What is the value of the constant c that makes f(x) a probability density function; and what if f(x) = cx for x in [0,4]?

A. 1/4 and 1/7

B. 1/7 and 1/9

C. 1/4 and 1/6

D. None of the above

ANSWER: D

QUESTION NO: 10

Calculate the determinant of the following matrix:

A. 4.25

B. -4.25

C. 4

D. 2

ANSWER: D

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