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Mock NBT MAT Paper 1 Memo

Practice 20 NBT-type multiple-choice questions compiled by Euler Education below.

1. What is the remainder when $3x^3 - 5x^2 - 7x + 20$ is divided by $x^2 - 2x - 3$?

A) $4x + 23$	B) $2x + 3$	C) $3x - 2$	D) $23x + 1$

2. What is the value of $\sin^2(x) + \cos^2(x)$ equal to?

A) 0	**B)** 1	C) $\frac{1}{2}$	D) -1

3. What is $a^n - a^{(n-1)}$ equal to?

A) a^{n+1}	B) a^{n-1}	C) a^{2n}	**D)** $a^{(n-1)}(a-1)$

4. If the sum of the first n terms of an arithmetic series is $n(3n + 5)$, what is the tenth term of the series?

A) $3n + 5$	B) 30	C) $30n$	**D)** 62

5. Simplify $((ab)^{-1})((a^{-1} + b^{-1})^{-1})$.

A) $\frac{1}{b+a}$	B) $\frac{1}{ab}$	C) $\frac{b}{a}$	D) $\frac{a}{b}$

6. What is $\cos(75) \cdot \sin(60) + \cos(15) \cdot \sin(30)$ equal to?

A)1	B) 3	C) $\sqrt{2}$	**D)** $\frac{\sqrt{2}}{2}$

7. Evaluate $3^4 + 5 \times 2 - 7$.

A) 106	**B)** 84	C) 33	D) 91

8. An isosceles triangle has an area of $15\,\text{cm}^2$ and a base of $6\,\text{cm}$. If the height is $6\,\text{cm}$, what is the perimeter of the triangle?

A) $6 + 6\sqrt{5}$	B) $5\sqrt{5}$	C) $6 + 5\sqrt{3}$	D) $6 + 3\sqrt{5}$

9. If $g(x)$ is a quadratic function such that $g(1) = 3, g(2) = 9, \text{and } g(0) = -1$, determine $g(4)$:

A) 36	B) 27	C) 32	D) 24

10. Iman and Emily each throw coins. What is the probability that Emily more heads than Iman?

A) $\frac{1}{6}$	B) $\frac{5}{12}$	C) $\frac{1}{3}$	D) $\frac{1}{4}$

11. Consider the triangle with vertices A(2 ; 4), (B6 ; 1), and C(3 ; 1). What is the area of triangle ABC?

A) $7\ units^2$	B) $4.5\ units^2$	C) $9\ units^2$	D) $10\ units^2$

12. If the area of a circle is doubled, what is the difference in length between the old and the new circumference in terms of the old radius?

A) $2\sqrt{2}\pi r_{old}(\sqrt{2}-1)$	B) $\pi r_{old}(\sqrt{2}-1)$	C) $2\pi r_{old}(\sqrt{2}-1)$	D) $2r_{old}(\sqrt{2}\pi-1)$

13. If $x + y = 10$ and $x^3 + y^3 = 1170$, then the value of xy is:

A) $-\frac{23}{3}$	B) $\frac{3}{28}$	C) $-\frac{17}{3}$	D) $\frac{3}{8}$

14. If $\frac{4}{3x^2-6x+4} = 4$, then the value of $\frac{1}{x^2+8x+9}$ equals:

A) $\frac{1}{24}$	B) $\frac{1}{15}$	C) $\frac{1}{12}$	D) $\frac{1}{18}$

15. If $\sin(B) + 2\csc(B) = 3$, then $\cos(B)$ is equal to:

A) $-\frac{4}{3}$	B) 0	C) $\frac{1}{2}$	D) -2

16. What is $\log_2(64) - \log_5(125)$ equal to?

A) 3	B) 4	C) 5	D) 6

17. The perimeter of a regular hexagon is equal to the circumference of a circle. What is the ratio of the area of the hexagon to the area of the circle?			
A) $\frac{\pi\sqrt{3}}{4} : \frac{9}{\pi}$	B) $\frac{\pi\sqrt{6}}{4} : \frac{3}{\pi}$	C) $\frac{\sqrt{3}}{2} : \frac{3}{\pi}$	D) $\frac{\sqrt{3}}{4} : \frac{9}{\pi}$

18. If $\sin 45° = \mathrm{m}$, then the value of $\sin 135°$ equals to:			
A) $\sqrt{2}m$	B) m	C) $\sqrt{2} - m$	D) $m + \sqrt{2}$

19. Jeff Bezos, for some peculiar reason, purchases m amount of apples. He turns $\mathrm{t}\%$ of them into apple sauce. How many apples are left?			
A) $\frac{100\mathrm{m}-\mathrm{t}}{100}$	B) $\frac{100\mathrm{m}-\mathrm{mt}}{100}$	C) $\frac{\mathrm{m}-100\mathrm{mt}}{100}$	D) $\frac{\mathrm{mt}-100\mathrm{mt}}{100\mathrm{m}}$

20. A Lamborghini Huracán car is traveling on a straight road at 180 km/h. Calculate the distance traveled by the car in 15 seconds.			
A) 500 m	B) 750 m	C) 800 m	D) 900 m

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