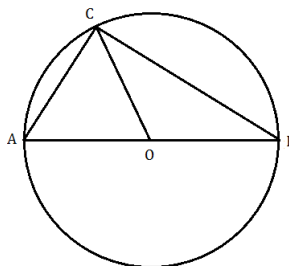


MDPT Practice Test 1 (Pre-Calculus)

1. What is the radian measure of an angle whose degree measure is 72° ?

- a) $\frac{5}{2\pi}$ b) $\frac{2\pi}{5}$ c) $\frac{\pi}{5}$ d) $\frac{2}{5}$ e) $\frac{1}{5}$

2. In the figure to the right, AB is the diameter of the circle with center O . If the length of OC is 10 and the length of BC is 16, what is the length of AC ?



- a) 11 b) 20 c) 8 d) 10 e) 12

3. One solution to $z^2 + 64 = 0$ is

- a) $8i$ b) -64 c) 8 d) $64i$ e) -8

4. $\sqrt{36x^{10}y^{12} - 36y^{12}} =$

- a) $6x^5y^6$ c) $6y^6\sqrt{x^{10} - 1}$ d) $36y^6\sqrt{x^{10} - 1}$
 b) $36x^5y^6 - 36y^6$ e) $6x^5y^6 - 6y^6$

5. $(27a^{-3}b^9c^6)^{1/3} =$

- a) $9ab^3c^2$ b) $3ab^3c^2$ c) $\frac{3b^3c^2}{a}$ d) $\frac{b^3c^2}{3a}$ e) $\frac{9b^3c^2}{a}$

6. If $\sin \theta = \frac{3}{5}$ and $0 \leq \theta \leq \frac{\pi}{2}$, then $\tan \theta =$

- a) $\frac{3}{2}$ b) $\frac{4}{3}$ c) $\frac{5}{4}$ d) $\frac{4}{5}$ e) $\frac{3}{4}$

7. $\left(\frac{x^2 - 9}{x^2 - 1} \cdot \frac{(x + 1)^2}{(2x + 3)(x + 3)} \right) \div \frac{2x - 6}{1 - x} =$

- a) $\frac{2(x - 3)^2(x + 1)}{(x - 1)^2(2x + 3)}$ b) $\frac{x + 1}{2(2x + 3)}$ d) $-\frac{x + 1}{2(2x + 3)}$
 c) $-\frac{x + 1}{(x - 1)(2x + 3)}$ e) *none of the above*

8. $\frac{\frac{1}{x-5} + \frac{11}{(x-5)^2}}{x+1} =$

a) $\frac{11}{(x-5)(x+1)}$

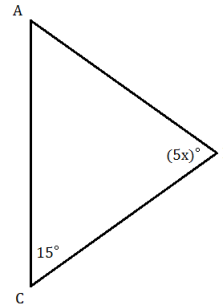
c) $\frac{12}{(x-5)^2(x+1)}$

d) $\frac{(x-6)(x+1)}{(x-5)^2}$

e) $\frac{12(x+1)}{(x-5)^2}$

b) $\frac{x+6}{(x-5)^2(x+1)}$

9. In the triangle ABC to the right, the length of AB is equal to the length of BC . What is x ?



a) 233

b) 3

c) 33

d) 12

e) 30

10. Which of the following can NOT be a root of the polynomial $x^4 - 8x^3 - 19x^2 + 158x + 168$?

a) 7

b) -4

c) 6

d) 1

e) -1

11. In the quadrilateral $ABCD$, the diagonals AC and BD bisect each other and are perpendicular. Which of the following could be a description of $ABCD$?

I. a rectangle which is not a square

II. a rhombus which is not a square

III. a parallelogram which is not a rhombus

IV. a square

a) I,II,III, and

b) II and III

c) I and IV

d) IV only

e) II and IV

IV

12. What is the distance between the points $(7, 8)$ and $(6, 1)$?

a) $\sqrt{82}$

b) $\sqrt{48}$

c) $\sqrt{50}$

d) $\sqrt{218}$

e) $\sqrt{40}$

13. If $16^x 16^{x+12} = 16^{3x-4}$, then $x =$

a) 8

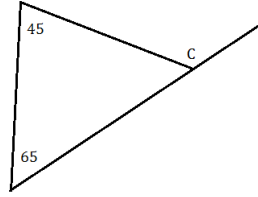
b) 16

c) $-\frac{2}{5}$

d) $\frac{-9 + \sqrt{65}}{2}$

e) $\frac{16}{3}$

14. In the figure to the right, the measures of the the angles are given in degrees. What is the measure of angle C ?



- a) 115° b) 20° c) 110° d) 70° e) 55°

15. $\frac{xy^2}{(3x^2y^{-1})^{-4}} =$

- a) $\frac{81}{x^7y^2}$ b) $\frac{1}{81x^7y^2}$ c) $\frac{y^6}{81x^7}$ d) $\frac{81x^9}{y^2}$ e) $81x^9y^6$

16. $\log_b c = 4$ means

- a) $4^c = b$ b) $b^4 = c$ c) $c^4 = b$ d) $b^c = 4$ e) $4^b = 6$

17. The point $(3, -5)$ is reflected across the x -axis, then across the y -axis, then across the line $y = x$. What is the resulting point?

- a) $(5, -3)$ b) $(-3, 5)$ c) $(5, 3)$ d) $(-3, -5)$ e) $(3, 5)$

18. $-2|3 - x| - 5 \geq -7$ is equivalent to

- a) $x \leq 2$ and $x \geq 4$ c) $2 \leq x \leq 4$ e) $x \leq -4$ and $x \geq 2$
 b) $-4 \leq x \leq 2$ d) $x \leq -2$ and $x \geq 4$

19. $\frac{\sqrt[3]{27x}}{\sqrt{81x}} =$

- a) $\frac{\sqrt{3}}{\sqrt[6]{x}}$ b) $\frac{1}{3}$ c) $\sqrt{3} \cdot \sqrt[6]{x}$ d) $\frac{1}{3\sqrt[6]{x}}$ e) $\frac{\sqrt{x}}{3}$

20. $(cd^3)^3 \cdot (-2c^4d)^4$

- a) $-2c^{19}d^{13}$ b) $16c^9d^{10}$ c) $16c^{48}d^{36}$ d) $-2c^7d^7$ e) $16c^{19}d^{13}$

21. If $\log_{11}(x + 4) = 2 \log_{11} 5$, then $x =$

- a) 6 b) 1 c) 25 d) 14 e) 21

22. The inequality $x^2 - 2x < 8$ is equivalent to which of the following?

- a) $x < 4$ or $x > -2$ c) $-4 < x < 2$ e) $x < 4$
 b) $x < -4$ or $x > 2$ d) $-2 < x < 4$

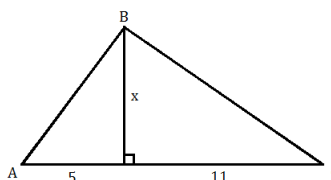
23. One root of $2x^2 - 2x - 1$ is

- a) $\frac{-1 + \sqrt{3}}{2}$ b) $\frac{1 - \sqrt{3}}{2}$ c) $\frac{1 + \sqrt{5}}{2}$ d) 1 e) $\frac{1}{2}$

24. Leslie is in the center of a circular track of radius 60 feet watching Katrina and Jensine run a race. When Katrina wins, Leslie notices that the angle formed by drawing a line from the center of the track to Katrina and a line from the center of the track to Jensine measures $\frac{\pi}{6}$ radians. How far, in feet, behind Katrina is Jensine when Katrina wins?

- a) 360 b) 60π c) 10π d) $\frac{\pi}{3}$ e) $\frac{\pi}{6}$

25. Angle ABC in the figure to the right is a right angle. What is x ?



- a) 8 b) $\sqrt{55}$ c) $\sqrt{96}$ d) 55 e) $\frac{5}{11}$

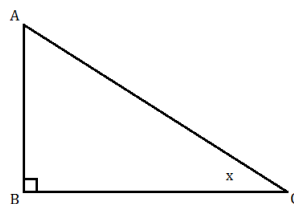
26. If $\log_2(x^2 - 33) - \log_2 x = 3$, then $x =$

- a) $\sqrt{41}$ b) $\frac{1 + \sqrt{165}}{2}$ c) 11 d) -3 and 11 e) $\frac{1 \pm \sqrt{165}}{2}$

27. If $9^x = 3^{1-2x}$, then $x =$

- a) $-\frac{1}{3}$ b) $-\frac{1}{4}$ c) $\frac{1}{4}$ d) $\frac{1}{3}$ e) $\frac{1}{2}$

28. In the right triangle ABC shown at the right, the length of AB is 6 and the measure of angle ACB is x° . What is the length of AC ?



- a) $\frac{6}{\cos x}$ b) $6 \cos x$ c) $\frac{6}{\sin x}$ d) $\frac{\sin x}{6}$ e) $6 \sin x$

29. $\frac{y}{x + 5y} - \frac{4}{9x - 13} =$

- a) $\frac{y - 4}{9x^2 + 45xy - 13x - 65y}$ c) $\frac{9xy - 33y - 4x}{9x^2 + 45xy - 13x - 65y}$ e) $\frac{y - 4}{-8x + 5y - 13}$
 b) $\frac{9xy + 7y - 4x}{9x^2 + 45xy - 13x - 65y}$ d) $\frac{9xy + 7y + 4x}{9x^2 + 45xy - 13x - 65y}$

30. The inequality $x^2 + 8x > -12$ is equivalent to

- a) $x > 6$ or $x > 2$ c) $-6 < x < -2$ e) $x < -6$ and $x < -2$
b) $x < -6$ or $x > -2$ d) $2 < x < 6$

31. If $\log_5 x - \log_5 (x + 2) = \log_5 11$, then $x =$

- a) $\frac{-2 + \sqrt{48}}{2}$ b) $\frac{9}{2}$ c) $-\frac{11}{5}$ d) $-\frac{1}{5}$ e) *No solution*

32. A circle has circumference 12π . What is the area of the circle?

- a) 36π b) 144π c) 6π d) 12π e) $6\pi^2$

33. Katrina has a circular garden plot of area A square feet. If she increases the diameter by a factor of 2, what is the area of her new garden?

- a) $2A$ b) $2A^2$ c) $4A^2$ d) $(A + 2)^2$ e) $4A$

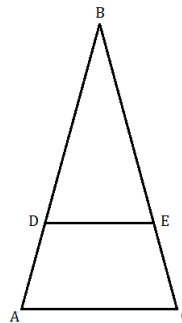
34. If $f(x) = 7x^2 - x + 2$, then $f(c - 4) =$

- a) $7c^2 - 57c + 118$ c) $7c^2 - 55c + 118$ e) $7c^2 - c - 2$
b) $7c^2 - 9c + 22$ d) $7c^2 - 57c + 110$

35. Lines l_1 and l_2 are parallel. Line l_3 is perpendicular to l_2 . Which of the following is NOT true?

- a) Line l_3 is perpendicular to l_1 .
b) If line l_4 is perpendicular to l_3 , then l_4 is parallel to l_1 .
c) If line l_4 is parallel to l_3 , then l_4 is parallel to l_1 .
d) Line l_1 intersects l_3 .
e) If line l_4 is not perpendicular to l_3 , then l_4 intersects l_2 .

36. In the figure at the right, the length of AC is 12, the length of DE is 9, the length of BC is 20, and the segments DE and AC are parallel. What is the length of EC ?



- a) 5 b) 15 c) 8 d) 7 e) 4