MATHS

BOOKS - KAPLAN INC MATHS (ENGLISH)

PRACTICE TEST 2

Practice Test

1. If $\dfrac{x+y}{0.01} = 7$, then $\dfrac{1}{2x+2y} =$

A. 0.14

B. 0.28

C. 3.50

D. 7.14

Answer: D

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2. $\dfrac{\left(100^{12}\right)\left(10^{4}\right)}{10^{2}} =$

A. 10^{8}

B. 10^{14}

C. 10^{24}

D. 10^{26}

Answer: D

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3. If $\dfrac{x^2}{4} = \dfrac{6}{x}$, then =

A. 2.59

B. 2.88

C. 3.03

D. 3.89

Answer: B

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4. Which of the following is an equation of a line that will have points in all the quadrants except the first ?

A. $y = 2x$

B. $y = 2x + 3$

C. $y = 2x - 3$

D. $y = -2x - 3$

Answer: D

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5. If $b = 3 - a$ and $b \neq a$, then $\dfrac{a^2 - b^2}{b - a} =$

A. 3

B. 1

C. 0

D. -3

Answer: D

6. If $f(x) = e^x + 2x$, then $f(\ln 2) =$

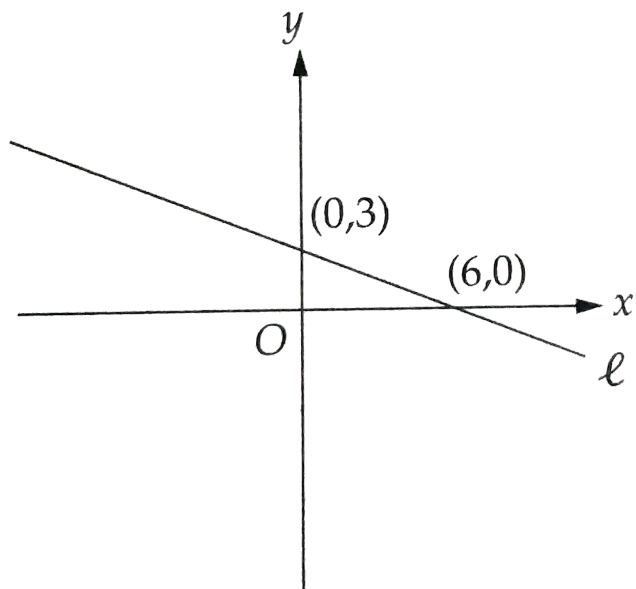A. 1.20

B. 2.69

C. 2.77

D. 3.39

Answer: D

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7. Which of the following is the slope of line l ?

A. -3

B. -2

C. $-\dfrac{1}{2}$

D. $\dfrac{1}{2}$

Answer: C

8. Which of the following is the complete solution set to the inequality $|x| + |x - 3| > 3$?

A. $\{x : x > 3 \text{ or } x < 0\}$

B. $\{x : -3 < x < 3\}$

C. $\{x: -3 > x\}$

D. $\{x: -3 < x\}$

Answer: A

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9. Which of the following is the solution set

for $(3x - 6)(2 + x) < 0$?

A. $\{x: x < 2\}$

B. $\{x: x > 2\}$

C. $\{x : x > \ -2\}$

D. $\{x : \ -2 < x < 2\}$

Answer: D

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10. Of a line passes through the points (5, 3) and (8, -1), at what point will this line intersect the y - axis ?

A. (0,8.33)

B. (0,8.67)

C. (0,9.00)

D. (0,9.67)

Answer: D

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11. If $f(x) = 2x + 1$, and

$f(x + 2) + f(x) = x$, the value of x is

A. -2

B. -1

C. $-\dfrac{1}{2}$

D. $\dfrac{1}{2}$

Answer: A

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12. Set S is the set of all points (x, y) in the coordinate plane such that x and y both integers with absolute value less than 4. If one of these points is chosen at random, what is

the probability that this point will be 2 units or less from the origin ?
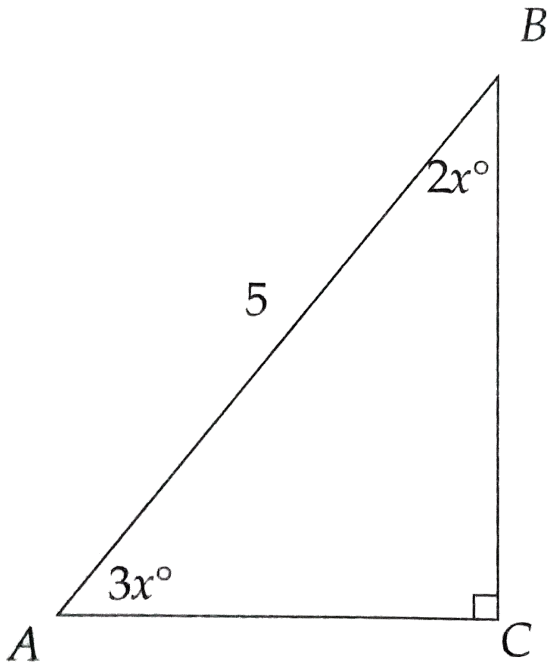
A. 0.189

B. 0.227

C. 0.265

D. 0.314

Answer: C

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13. What is the length of AC ?

A. 2.94

B. 3.49

C. 3.81

D. 4.05

Answer: A

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14. If $a = \sqrt[3]{t}$ and $b = t^2$, then $\dfrac{b}{a^5} =$

A. $t^{-\frac{1}{3}}$

B. $t^{\frac{1}{3}}$

C. $t^{\frac{5}{6}}$

D. $t^{\frac{6}{5}}\backslash$

Answer: B

15. If A, B, C, D, E and F are 6 distinct points on the circumference of a circle, how many different chords can be drawn using any 2 of the 6 points ?

    A. 6

    B. 12

    C. 15

D. 30

Answer: C

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16. A new computer can perform x calculations in y seconds and an older computer can perform r calculations in s minutes. If these two computers work simultaneously, how many calculations can be performed in t minutes ?

A. $t\left(\dfrac{x}{60y} + \dfrac{r}{s}\right)$

B. $t\left(\dfrac{60x}{y} + \dfrac{r}{s}\right)$

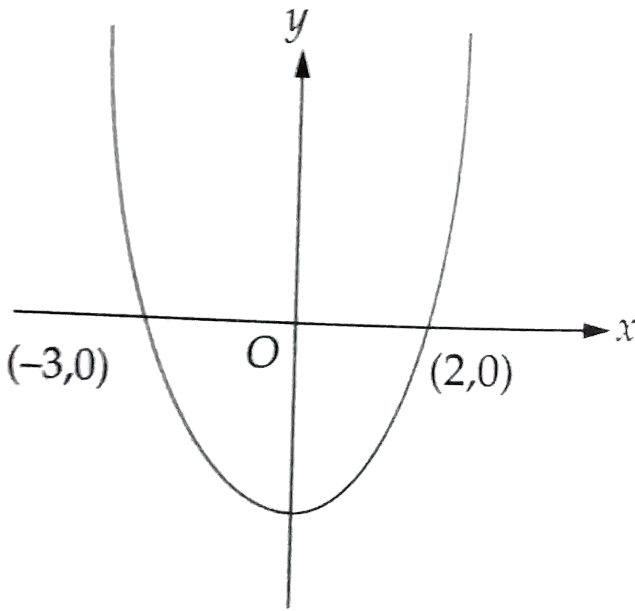C. $t\left(\dfrac{x}{y} + \dfrac{r}{s}\right)$

D. $t\left(\dfrac{x}{y} + \dfrac{60r}{s}\right)$

Answer: B

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17. Which of the following could be the equation of the parabola in Figure ?

(−3,0)   O   (2,0)

A. $y = (x - 2)(x - 3)$

B. $y = (x + 2)(x + 3)$

C. $y = (x + 2)(x - 3)$

D. $y = (x - 2)(x + 3)$

Answer: D

18. If $a + b = 15$, $b + c = 10$, and $a + c = 13$,

which of the following is true ?

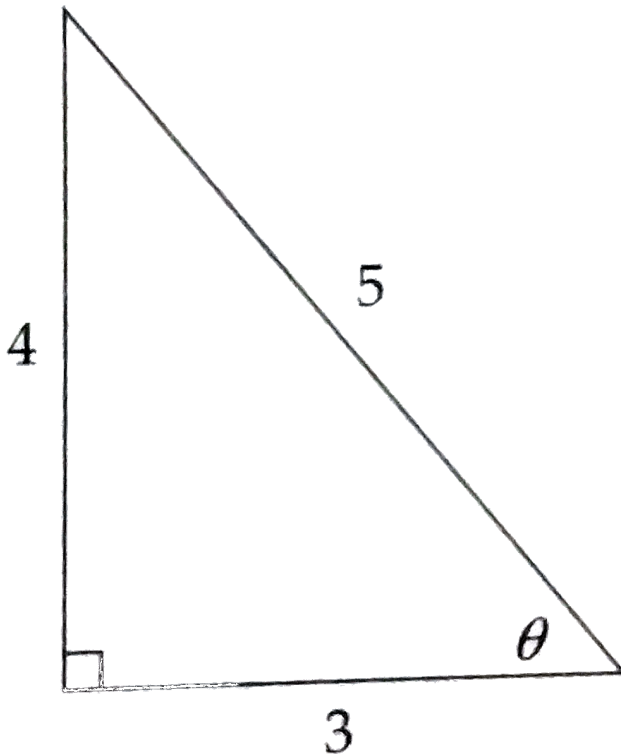   A. $a < b < c$

    B. $b < a < c$

    C. $c < b < a$

    D. $a < c < b$

Answer: C

19. $\dfrac{1}{\sin\theta} + \dfrac{1}{\cos\theta} =$

A. 0.75

B. 1.20

C. 1.43

D. 2.92

Answer: D

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20. Amanda goes to the toy store to buy 1 ball - either a football, basketball , or soccer ball - and 3 different board games. If the toy store is

stocked with all types of balls but only 6 different types of board games, how many different selections of 4 items can Amanda make condisting of 1 type of ball and 3 different board games ?

A. 18

B. 20

C. 54

D. 60

Answer: D

21. If point P(3, 2) is rotated 90 degree counterclockwise with respect to the origin, what will be its new coordinates ?

A. $(- 2, 3)$

B. $(- 2, - 3)$

C. $(- 3, 3)$

D. $(- 3, 2)$

Answer: A

22. If $0 < x < \dfrac{\pi}{2}$ and $\tan x = \dfrac{a}{2}$, then $\cos x =$

A. $\dfrac{2}{\sqrt{a^2 - 4}}$

B. $\dfrac{a}{\sqrt{a^2 - 4}}$

C. $\dfrac{2}{a + 2}$

D. $\dfrac{2}{\sqrt{a^2 + 4}}$

Answer: D

23. For what value of x will $f(x) = (1 - 2x)^2$ have the minimum value ?

A. -1

B. $-\dfrac{1}{2}$

C. 0

D. $\dfrac{1}{2}$

Answer: D

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24. If a certain line intersects the origin and is perpendicular to the line with the equation $y = 2x + 5$ at point P, what is the distance from the origin to point P ?

A. 2.24

B. 2.45

C. 2.67

D. 3.25

Answer: A

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25. If the volume of a cube is equal to the volume of a sphere, what is the ratio of the edge of the cube to the radius of the sphere ?

A. 1.61

B. 2.05

C. 2.33

D. 2.45

Answer: A

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26. If [x] represents the greatest integer less than or equal to x, what is the solution to the equation $1 - 2[x] = -3$?

A. $x = 2$

B. $2 \leq x < 3$

C. $2 < x \leq 3$

D. $2 < x < 3$

Answer: B

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27. Which of the following lists all and only the vertical asympototes of the graph $y = \dfrac{x}{x^2 - 4}$?

    A. x = 2 only

    B. y = 2 only

    C. x = 2 and $x = -2$

    D. y = 2 and $y = -2$

Answer: C

28. If cos x sin x = 0.22, then $(\cos x - \sin x)^2 =$

A. 0

B. 0.11

C. 0.44

D. 0.56

Answer: D

29. If water is poured at a rate of 12 cubic meters per second into a half-empty rectangular tank with length 5 meters, width 3 meters, and height 25 meters, then how high, in meter, will the water level be after 9 seconds ?

A. 6.0

B. 7.2

C. 18.5

D. 19.7

Answer: D

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30. A circle centered at (3, 2) with radius 5 intersects the x - axis at which of the following x - coordinates ?

A. 2.39

B. 4.58

C. 7.58

D. 8.00

Answer: C

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31. If $0 \leq x \leq \pi$, where is $\dfrac{\tan x}{\sin x}$ defined ?

A. $0 \leq x \leq \pi$

B. $0 < x < \pi$

C. $0 < x < \dfrac{\pi}{2}$

D. $0 < x < \dfrac{\pi}{2}$ and $\dfrac{\pi}{2} < x < \pi$

Answer: D

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32. A rectangular box with an open top is constructed from cardboard to have a square base of area x^2 and height h. If the volume of this box is 50 cubic units, how many square units of cardboard in terms of x, are needed to build this box ?

A. $5x^2$

B. $6x^2$

C. $\dfrac{200}{x} + x^2$

D. $\dfrac{200}{x} + 2x^2$

Answer: C

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33. $\dfrac{(n+2)! - (n+1)!}{n!} =$

A. $(n+2)!$

B. $(n+1)!$

C. $(n+2)^2$

D. $(n+1)^2$

Answer: D

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34. Bob wishes to borrow some money. He needs to defer to the following formula, where M is the monthly payment, r is the monthly decimal interest rate, P is the amount

borrowed, and t is the number of months it will take to repay the loan :

$$M = \frac{rP}{1 - \left(\frac{1}{1+r}\right)^t}$$

If Bob secures a loan of $4, 00 that he will pay back in 36 months with a monthly interest rate of 0.01, what is his monthly payment ?

A. $111.11

B. $119.32

C. $132.86

D. $147.16

Answer: C

35. A particle is moving along the line $5y = -6x + 30$ at a rate of 2 units per second. If the particle starts at the y-intercept and moves to the right along this line, how many seconds will it take for the particle to reach the x - axis ?

A. 2.50

B. 3.25

C. 3.76

D. 3.91

Answer: D

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36. If the area of triangle ABC is 15, what is the length of AC ?
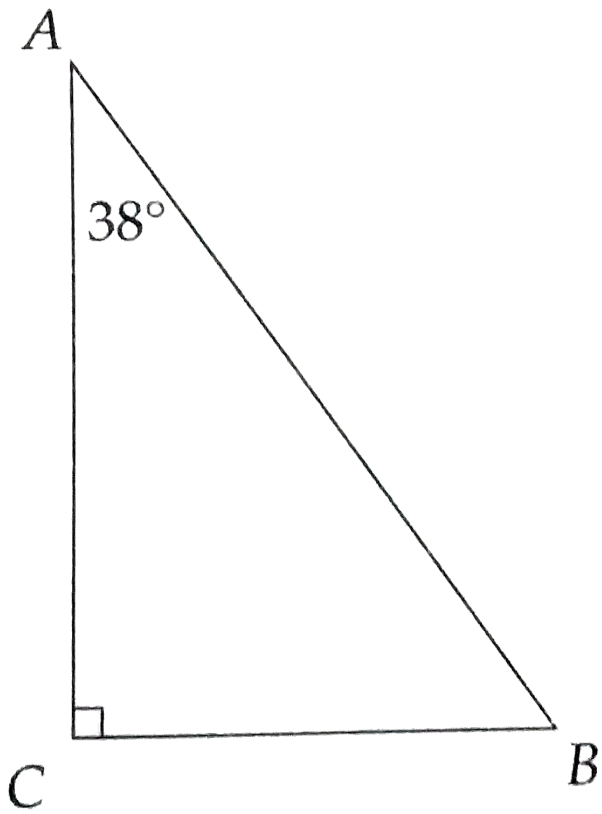
A. 2.1

B. 4.1

C. 6.2

D. 8.2

Answer: C

37. Which of the following functions has a range of $-1 < y < 1$?

A. $y = \sin x$

B. $y = \cos x$

C. $y = \dfrac{x}{1 + x}$

D. $y = \dfrac{x}{\sqrt{1 + x^2}}$

Answer: D

38. What is the sum of the infinite series $1 - \dfrac{1}{3} + \dfrac{1}{9} - \dfrac{1}{27} + \ldots$?

A. $\dfrac{2}{3}$

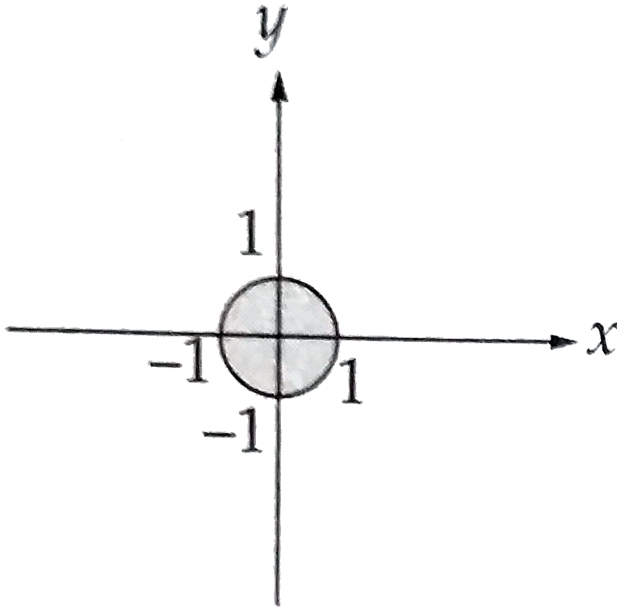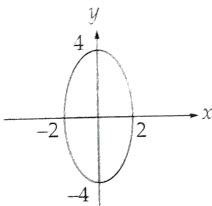B. $\dfrac{3}{4}$

C. 1

D. $\dfrac{4}{3}$

Answer: B

39. The shaed region represents the set C of all points (x, y) such that $x^2 + y^2 \leq 1$. The transformation T maps the point (x, y) to the point (2x, 4y). Which of the following shows the mapping of the set C by the
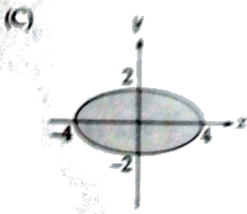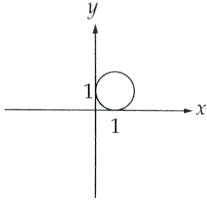
transformation T ?
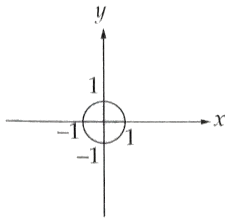
A.

B.

C.

D.

Answer: B

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40. $\lim\limits_{n \to \infty} \dfrac{1 - 2n^2}{5n^2 - n + 100} =$

A. -1

B. $-\dfrac{2}{5}$

C. $\dfrac{2}{5}$

D. 1

Answer: B

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41. If $\log_2\left(x^2 - 3\right) = 5$, which of the following could be the value of x ?

A. 3.61

B. 4.70

C. 5.29

D. 5.92

Answer: D

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42. If 2 is a zero of the function $f(x) = 6x^3 - 11x^2 - 3x + 2$, what are the other zeroes ?

A. $-\dfrac{1}{3}$ and $-\dfrac{1}{2}$

B. $-\dfrac{1}{3}$ and $\dfrac{1}{2}$

C. $\dfrac{1}{3}$ and $-\dfrac{1}{2}$

D. $\dfrac{1}{3}$ and $\dfrac{1}{2}$

Answer: C

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43. A circle of radius 1 is placed on an incline where point P, a point on the circle, has the coordinates $(-5, -5)$. The circle is rolled up

the incline, and once the circle hits the origin, the circle is then rolled horizontally along the x - axis to the right. What is the x - coordinate of the point where P touches the incline or the x - axis for the fifth time (not including the starting point) ?
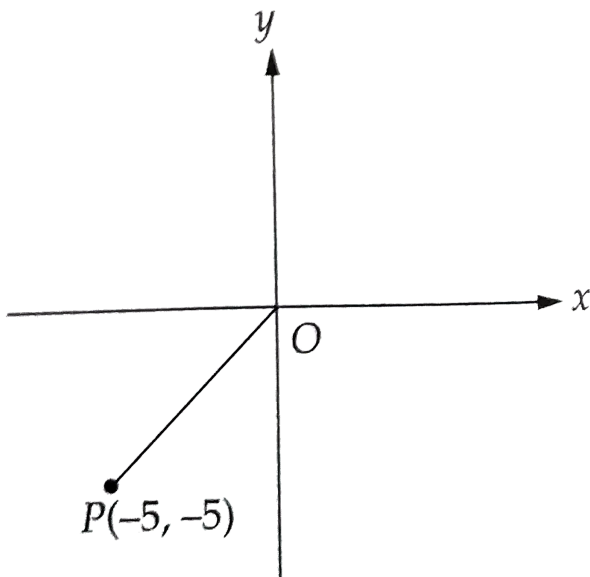
A. 8.64

B. 17.27

C. 24.34

D. 27.49

Answer: C

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44. If $0 \leq x \leq 2\pi$ and $\sin x < 0$, which of the

following must be true ?

I. $\cos x < 0$

II. $\csc x < 0$

III. $|\sin x + \cos x| > 0$

A. I only

B. II only

C. III only

D. I and II

Answer: B

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45. If $i^2 = -1$, which of the following is a square root of $8 - 6i$?

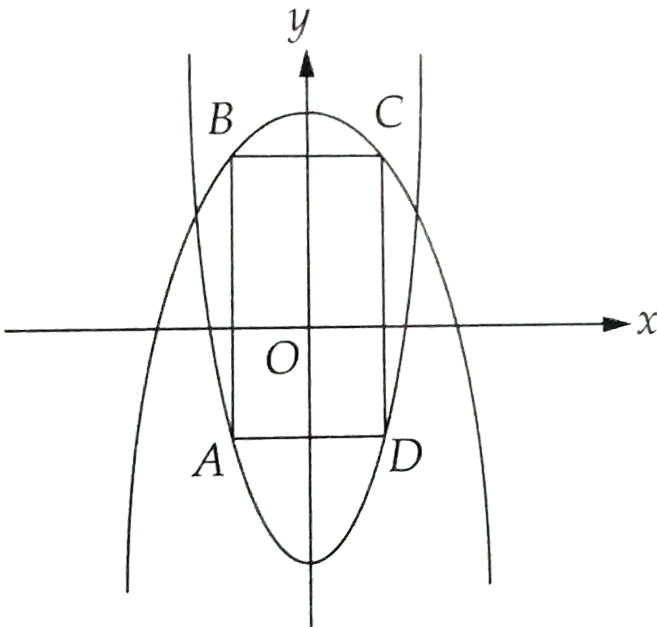A. $3 - i$

B. $3 + i$

C. $3 - 4i$

D. $4 - 3i$

Answer: A

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46. Figure shows rectangle ABCD. Points A and D are on the parabola $y = 2x^2 - 8$, and points B and C are on the parabola $y = 9 - x^2$. If point B has coordinates $(-1.50, 6.75)$, what is the area of rectangle ABCD ?

A. 12.50

B. 17.50

C. 22.75

D. 30.75

Answer: D

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47. If $x \geq 0$ and arcsin x = arccos (2x), then x =

A. 0.866

B. 0.707

C. 0.500

D. 0.447

Answer: D

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48. If $f(x) = \dfrac{1}{2}x - 4$ and $f(g(x)) = g(f(x))$, which of the following can be g(x) ?

I. $2x - \dfrac{1}{4}$

II. $2x + 8$

III. $\dfrac{1}{2}x - 4$

A. I only

B. II only

C. III only

D. II and III only

Answer: D

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49. If a right circular cylinder of height 10 is inscribed in a sphere of radius 6, what is the volume of the cylinder ?
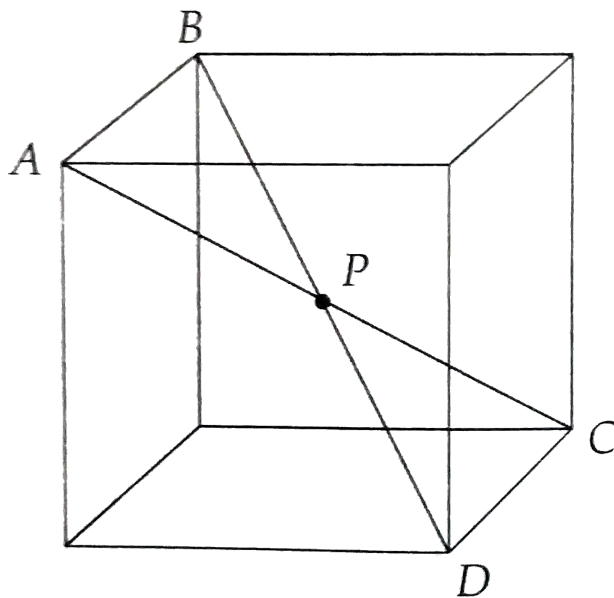
    A. 104

    B. 346

    C. 545

    D. 785

Answer: B

50. If the diagonals AC and BD intersect at point P in the cube in Figure what is the degree measure of angle APB ?

A. 60

B. 65

C. 71

D. 83

Answer: C

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