

Crappy DSE Maths Paper II (2023 B-side)

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Abstract

This is a paper created by a no-lifer. My sole purpose is to help the reader escape from the responsibilities of real life.

Contents

1	Problems	2
2	Solutions	5

1 Problems

Section A

1. If $\frac{3a+4b}{6a+7b} = \frac{5a+2b}{4a+9b}$ and $a \neq b$, then $a =$

A. $\frac{4b-3}{b^2+2}$.

B. $\frac{7}{13}b$.

C. $-\frac{2}{11}b$.

D. $-\frac{11}{9}b$.

2. $\frac{2x}{6x-7} - \frac{2x+5}{7+6x} =$

A. $\frac{5-28x}{36x^2-49}$.

B. $\frac{5+28x}{36x^2-49}$.

C. $\frac{35+2x}{36x^2-49}$.

D. $\frac{35-2x}{36x^2-49}$.

3. $\frac{16^{2n+1}27^{n-5}}{4^{n+17}} =$

A. 12^{n-5} .

B. 12^{3n-15} .

C. 24^{n-5} .

D. 24^{3n-15} .

4. $4x^2 - 16x^4 + 9y^2 - 81y^4 - 12xy + 72x^2y^2 =$

A. $(2x-3y)^2(2x+3y+1)(1-2x-3y)$.

B. $(2x-3y)^2(2x-3y+1)(1+2x-3y)$.

C. $(2x+3y)^2(2x+3y+1)(1-2x-3y)$.

D. $(2x+3y)^2(2x-3y+1)(1+2x-3y)$.

5. If m , n and c are positive constants such that

$$(mx+5)(x-n) + 2m - 1 \equiv (n-4)(x+1)x - (2n-3)(x+c)$$

, then $c =$

A. 2.

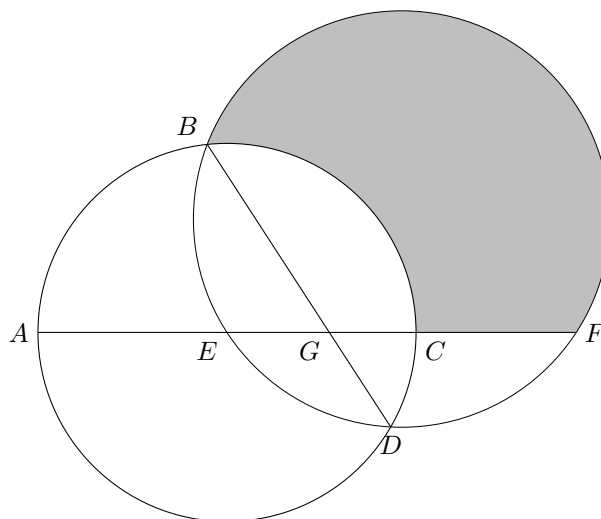
B. 3.

C. 6.

D. 9.

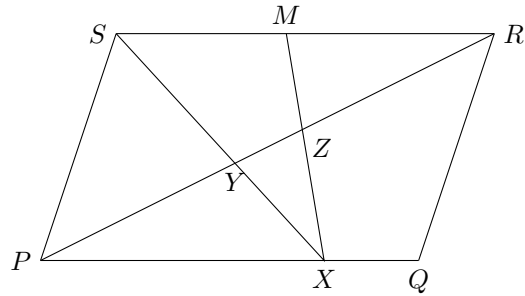
6. The number of integers satisfying the inequality $3x - 8 < \frac{2x + 7}{2} \leq 3(2x + 3)$ is
- 2 .
 - 3 .
 - 4 .
 - 5 .
7. If $0.01645 < x < 0.01654$, which of the following must be true?
- $x = 0.017$ (correct to 2 significant figures)
 - $x = 0.0164$ (correct to 3 significant figures)
 - $x = 0.016$ (correct to 3 decimal places)
 - $x = 0.0165$ (correct to 4 decimal places)
8. If $f(x) = 3x^2 - 5x - 8$, then $f(3m + 2) + f(3m - 2) =$
- $26m^2 - 15m + 8$
 - $26m^2 - 15m - 16$
 - $54m^2 - 30m + 8$
 - $54m^2 - 30m - 16$
9. Let $h(x) = 4kx^3 - 10x^2 + 8$, where k is a real constant. When $h(x)$ is divided by $2x - k$, the remainder is 26. Find the remainder when $h(x)$ is divided by $2x + k$.
- 13
 - 55
 - 16
 - 54
10. Which of the following statements about the graph of $y = (5 - x)(x + 3) - 7$ is true?
- The graph opens upwards.
 - The x -intercepts of the graph are -4 and 2 .
 - The vertex of the graph is $(1, 9)$.
 - The y -intercept of the graph is -7 .
11. Marcy sells a vase and a bag for $\$S$ each. She gains $x\%$ on the vase and loses $x\%$ on the bag. After the two transactions, Marcy loses $\$40$ in total. If the profit of selling the vase is $\$80$, find S .
- 480
 - 450
 - 320
 - 240

12. The actual area of a park is 0.5625 km^2 . If the area of the park on a map is 625 cm^2 , then the scale of the map is
- A. 1 : 90
 B. 1 : 3 000
 C. 1 : 75 000
 D. 1 : 9 000 000
13. It is given that z partly varies directly as x^2 and partly varies inversely as the cube root of y . When $x = 6$ and $y = 27$, $z = 7$. When $x = 15$ and $y = 125$, $z = -41$. When $x = 21$ and $y = 729$, $z =$
- A. -93
 B. -45
 C. 103
 D. 125
14. Let a_n be the n th term of a sequence. If $a_3 = 7$, $a_9 = 1393$ and $a_{n+2} = 2a_{n+1} + a_n$ for any positive integer n , then $a_6 =$
- A. 99
 B. 143
 C. 198
 D. 237
15. A right pyramid has a height of h cm and a square base of side s cm. Its volume is 11200 cm^3 and its total surface area is 3920 cm^2 . If $s > h$, find s .
- A. 15
 B. 20
 C. 40
 D. 42
16. In the figure, E is the centre of the circle $ABCD$, and $BEDF$ is another circle. It is given that C and E lie on AF . Let G be the point of intersection of AF and BD . If $BG = 15 \text{ cm}$, $DG = 8 \text{ cm}$ and $\angle BGE = 60^\circ$, find the area of the shaded region correct to the nearest cm^2 .



- A. 320 cm^2
- B. 341 cm^2
- C. 353 cm^2
- D. 399 cm^2

17. In the figure, $PQRS$ is a parallelogram. Let X be a point lying on PQ , and let Z be the mid-point of SR . Let PR and SX intersect at Y , and PR and MX intersect at Z . If the area of quadrilateral $SYZM$ and the area of quadrilateral $QRZX$ are 648 cm^2 and 1040 cm^2 respectively, then the area of $\triangle SPY$ is



- A. 672 cm^2
- B. 720 cm^2
- C. 848 cm^2
- D. 936 cm^2

2 Solutions

1. D
2. D
3. B
4. A
5. B
6. B (from D)
7. D
8. C
9. B
10. C
11. A
12. B (from C)
13. A
14. A
15. C (from A)
16. B (from D)
17. A

References