IPMAT / JIPMAT / IIM-B — PYQ Practice Sheet

Algebra: Inequalities

IPMAT Indore 2019 | Algebra > Inequalities | Hard

Q1. If $x \in (a, b)$ satisfies the inequality $(x - 3) / (x^2 + 3x + 2) \geq 1$, then the largest possible value of $b - a$ is

(a) 3
(b) 1
(c) 2
(d) No real values of x satisfies the inequality

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Q2. The set of values of x which satisfy the inequality $0.7^{(2x^2-3x+4)} < 0.343$ is

(a) (1/2, 1)
(b) (1/2, ∞)
(c) (–∞, 1/2)
(d) (–∞, 1/2) ∪ (1, ∞)

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Q3. Consider the following statements:

(i) When $(0 < x < 1)$, then $1/(1+x) < 1 - x + x^2$

(ii) When $(0 < x < 1)$, then $1/(1+x) > 1 - x + x^2$

(iii) When $(-1 < x < 0)$, then $1/(1+x) < 1 - x + x^2$

(iv) When $(-1 < x < 0)$, then $1/(1+x) > 1 - x + x^2$

Then the correct statements are:

(a) (i) and (ii)
(b) (ii) and (iv)
(c) (i) and (iv)
(d) (ii) and (iii)

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Q4. The set of all real values of x satisfying the inequality $x^2(x + 1) / [(x - 1)(2x + 1)^3] > 0$ is

(a) (–∞, –1) ∪ (–1/2, 0) ∪ (1, +∞)
(b) (–1, –1/2) ∪ (1, +∞)
(c) (–1, 0) ∪ (1, +∞)
(d) (–1, –1/2) ∪ (0, +∞)

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Q5. The smallest possible number of students in a class if the girls in the class are less than 50% but more than 48% is

(a) 27

(b) 100
(c) 200
(d) 25

2025: PYP 2025 | Algebra > Inequalities | Medium

Q6. If $2y + z > 0$, $2z > y$, and $z < 3$, find the range of possible values of $(y + z)$.

(a) $1 \leq y + z \leq 8$
(b) $0 < y + z \leq 8$
(c) $0 < y + z < 9$
(d) $-1.5 < y + z < 9$

BMSAT Kozhikode 2025 | Algebra > Inequalities | Medium

Q7. If $n \leq 4$ and $2 \leq m \leq n \leq 5$, then what is the greatest possible value of $(n - m)(n + m)$?

(a) 9
(b) 21
(c) 12
(d) None of these

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Q8. Find the sum of the smallest value and the greatest value of x that satisfy the inequality $|5x + 5| - 8 \leq 17$.

(a) 2
(b) –2
(c) 4
(d) –4

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Q9. A pair of consecutive odd positive integers, both of which are smaller than 19, have a sum that is more than 22. How many such pairs will there be, if we allow a number to be in more than one pair?

(a) 2
(b) 3
(c) 4
(d) 5

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Q10. Solve the inequality: $|2x + 5| \leq 3|2x - 1|$

(a) $x \geq -1/4$, or $x \leq 2$
(b) $x \geq -1/5$, or $x \leq 3$
(c) $x \leq -1/5$, or $x \geq 3$
(d) $x \leq -1/4$, or $x \geq 2$

Answer Key

Q1: (b)	Q2: (d)	Q3: (c)	Q4: (b)	Q5: (a)
Q6: (c)	Q7: (c)	Q8: (b)	Q9: (b)	Q10: (d)