HugeMathBrain — Grade 10 Printable Quiz

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Grade 10

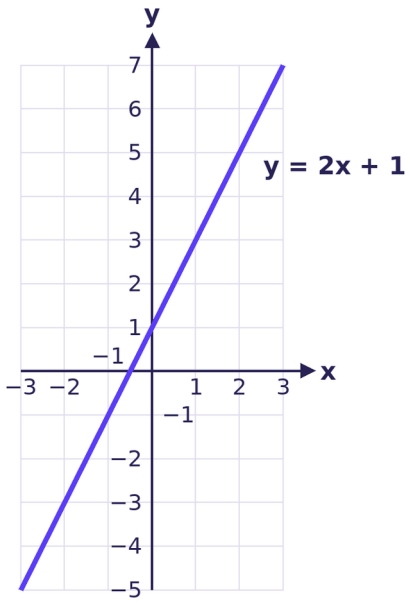
Problem 10.1 · 3 points — What is the minimum value of $x^2 - 6x + 11$?



A) -2
B) 2
C) 5
D) 3
E) 11

Problem 10.2 · 4 points — A square has one side from the drawn line’s y-axis crossing to its grid point with x = 1. Its interior is on the same side of the line as the origin. Which grid point is diagonally opposite the y-axis crossing?

The line y = 2x + 1



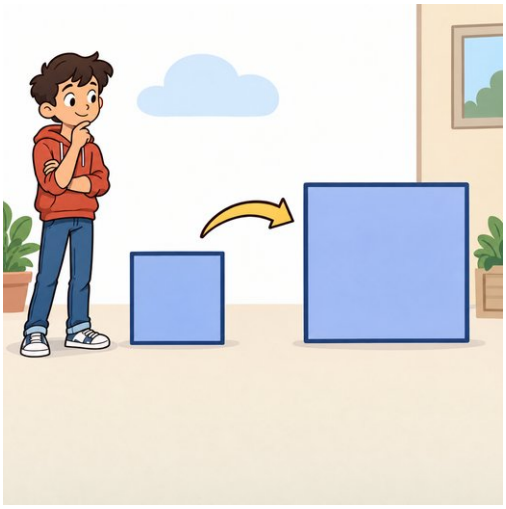
A) (−2, 2)
B) (−1, 4)
C) (2, 0)
D) (3, 4)
E) (3, 2)

Problem 10.3 · 4 points — Four sticker printers make 1, 2, 3, or 4 stickers per minute, and four batteries last 2, 5, 9, or 14 minutes each, regardless of printer. If each printer gets one battery and runs it empty, what is the second-largest total number of stickers possible?



A) 91
B) 94
C) 92
D) 95
E) 90

Problem 10.4 · 3 points — A square is enlarged so that its area’s percent increase is 24 percentage points greater than its perimeter’s percent increase. By what percent did each side increase?



A) 12%
B) 20%
C) 44%
D) 24%
E) 40%

Problem 10.5 · 3 points — A triangle sits inside a larger, similar triangle. The region between them has five-fourths the area of the inner triangle, and their perimeters add to 130 cm. What is the larger perimeter?



A) 65 cm
B) 78 cm
C) 650/9 cm
D) 90 cm
E) 52 cm

Problem 10.6 · 4 points — Let A = sin 15° + cos 75° and B = sin 75° + cos 15°. What is A/B + B/A?



A) 4
B) 2 + √3
C) 2 − √3
D) 2
E) 4/√3

Problem 10.7 · 4 points — A convex polygon is cut into triangles by noncrossing diagonals. Four triangles have no side on the polygon’s boundary, and five have exactly one boundary side. How many sides does the polygon have?

A) 15
B) 18
C) 14
D) 17
E) 16

Problem 10.8 · 5 points — Let $N = 2^5 \cdot 3^5 \cdot 5^5 \cdot 7^5$. How many positive divisors d of N have the property that both d and N/d have a perfect-square number of positive divisors?



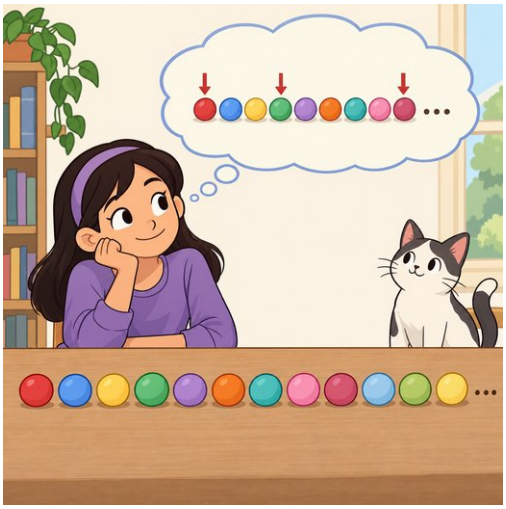
A) 36
B) 90
C) 96
D) 126
E) 120

Problem 10.9 · 5 points — What is the remainder when $1^1 + 2^2 + 3^3 + \cdots + 2020^{2020}$ is divided by 7?



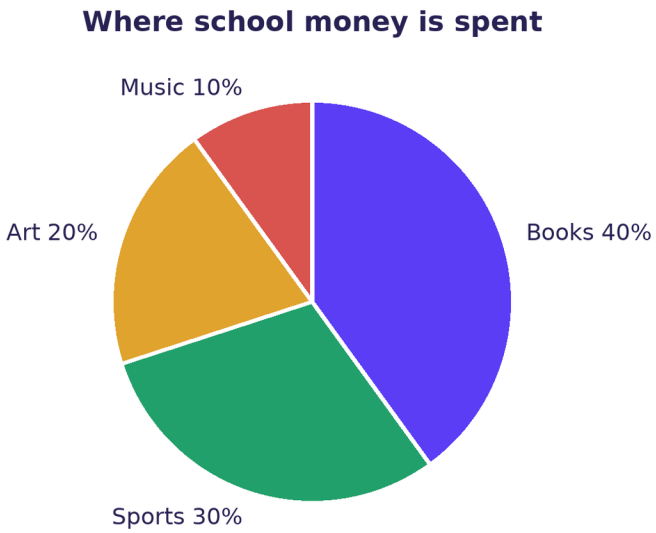
A) 2
B) 5
C) 1
D) 6
E) 0

Problem 10.10 · 5 points — Nora’s sequence of positive integers has this property: in any four consecutive terms, the product of the outer two equals the product of the inner two. If the 1st, 4th, and 9th terms are 2, 36, and 2592, what is the first position whose term is both a perfect cube and divisible by 2^100 × 3^101?



A) 201
B) 206
C) 202
D) 204
E) 203

Problem 10.11 · 5 points — Three points are picked independently and uniformly from inside the pie chart. Given that they land in three different slices, what is the probability that one lands in books?



A) 40%
B) 78.4%
C) 90%
D) 75%
E) 88%

Problem 10.12 · 3 points — Five cards start in the row 1, 2, 3, 4, 5. On each of exactly two turns, you choose any three positions and rotate their cards in either direction; which final row is impossible?



A) 2, 3, 4, 1, 5
B) 2, 3, 4, 5, 1
C) 1, 2, 3, 4, 5
D) 3, 1, 2, 4, 5
E) 2, 1, 4, 3, 5

Answer key

10.1: B
10.2: E
10.3: C
10.4: B
10.5: B
10.6: A
10.7: D
10.8: C
10.9: A
10.10: D
10.11: E
10.12: A