HugeMathBrain — Grade 11 Printable Quiz

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Grade 11

Problem 11.1 · 3 points — An increasing exponential function f has f(0) + f(2) = 25 and f(1) = 10. What is f(3)?



A) 40
B) 35
C) 20
D) 5/2
E) 30

Problem 11.2 · 3 points — For $x > 0$ with $x \neq 1$, suppose $\log_x 16 = \log_2 x$. What is the sum of all possible values of x?



A) 0
B) 1/4
C) 4
D) 17/4
E) 1

Problem 11.3 · 3 points — Twenty dots lie on the graph of a quadratic function, with equally spaced x-coordinates from left to right. The first three are (5, 41), (8, 110), and (11, 215); what is the height of the 20th dot?

A) 1352
B) 6791
C) 7508
D) 8261
E) 7502

Problem 11.4 · 4 points — For which real value of t does $(x^2 - 2tx + 1)(x^2 - 2x + t^2) = 0$ have exactly one distinct real solution for x?



A) $t = 1$
B) $t = -1$
C) $t = -1$ or $t = 1$
D) No real value of t
E) $-1 < t < 1$

Problem 11.5 · 5 points — Real numbers a, b, and c satisfy $a+b+c=0$ and $a^2+b^2+c^2=6$. What is the greatest possible value of $a^6+b^6+c^6$?



A) 78
B) 54
C) 72
D) 64
E) 66

Problem 11.6 · 4 points — Cups numbered 1, 2, 3, ... hold 2, 1, 1/2, 1/4, ... in order. Ada marks every even-numbered cup, and Ben marks every cup numbered by a multiple of 3; what is the sum in cups marked by exactly one of them?



A) 40/21
B) 4/7
C) 16/9
D) 116/63
E) 4/3

Problem 11.7 · 4 points — A bag holds 5 red and 5 blue marbles. You draw without replacement until all the marbles of one color have been drawn. What is the expected number of marbles left in the bag?



A) 3/2
B) 5/3
C) 5/6
D) 1
E) 2

Problem 11.8 · 5 points — How many circular arrangements of the letters AABBCCDD have no identical letters next to each other? Count rotations as the same, but do not identify mirror images.



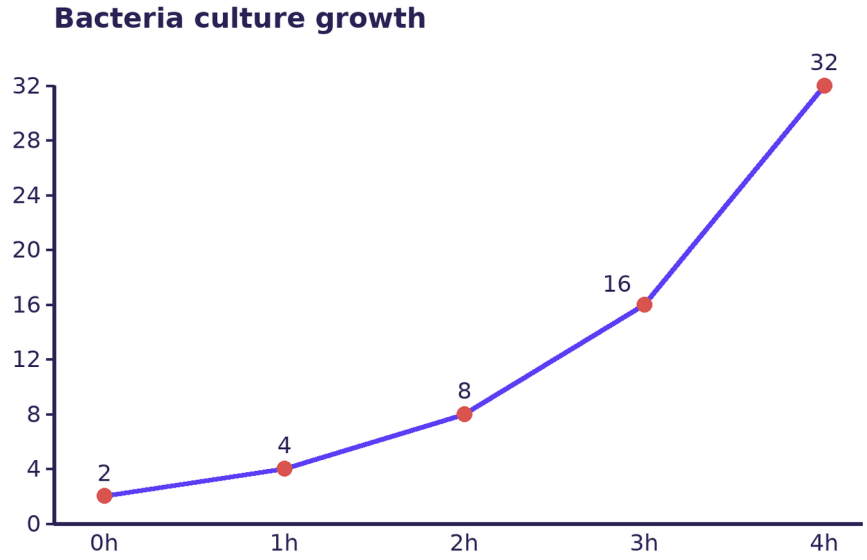
A) 318
B) 96
C) 315
D) 93
E) 744

Problem 11.9 · 5 points — A lock shows codes 3, 10, 23, 42, 67 for keys 1, 2, 3, 4, 5. Its hidden program is a polynomial with integer coefficients, but its degree is unknown; which code could key 6 show?



A) 122
B) 158
C) 128
D) 218
E) 138

Problem 11.10 · 5 points — If the chart’s exponential trend continues, what is the first whole-number hour after hour 4 when the bacteria count is a perfect fourth power and its increase since hour 4 is divisible by 49?

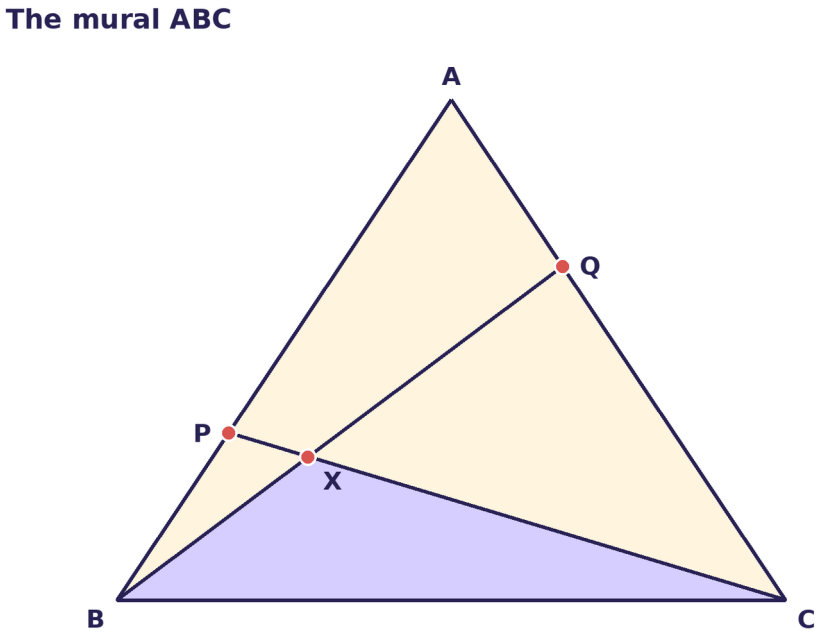


A) 68
B) 67
C) 46
D) 7
E) 25

Problem 11.11 · 3 points — Nine lamps, numbered 1 through 9 clockwise around a circle, start off. A move flips any three consecutive lamps; which set could be exactly the lamps left on?

A) {1, 2, 6, 8}
B) {1, 3, 6, 9}
C) {2, 4, 6, 7}
D) {1, 2, 3, 4}
E) {3, 4, 6, 7}

Problem 11.12 · 4 points — On a triangular mural ABC, P lies on AB with AP:PB = 2:1, and Q lies on AC with AQ:QC = 1:2. If CP and BQ cross at X, what fraction of the mural is triangle BXC?



A) 2/7
B) 1/7
C) 5/7
D) 1/3
E) 4/7

Answer key

11.1: A
11.2: D
11.3: C
11.4: A
11.5: E
11.6: C
11.7: B
11.8: B
11.9: D
11.10: B
11.11: E
11.12: A