

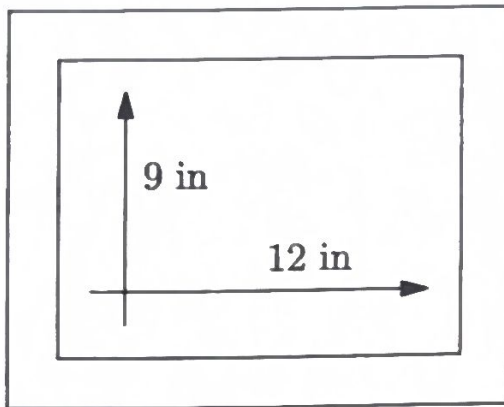
Bonus Learning

Do at least 10 problems, show your work.

9 Sept 2026 - Underline the question

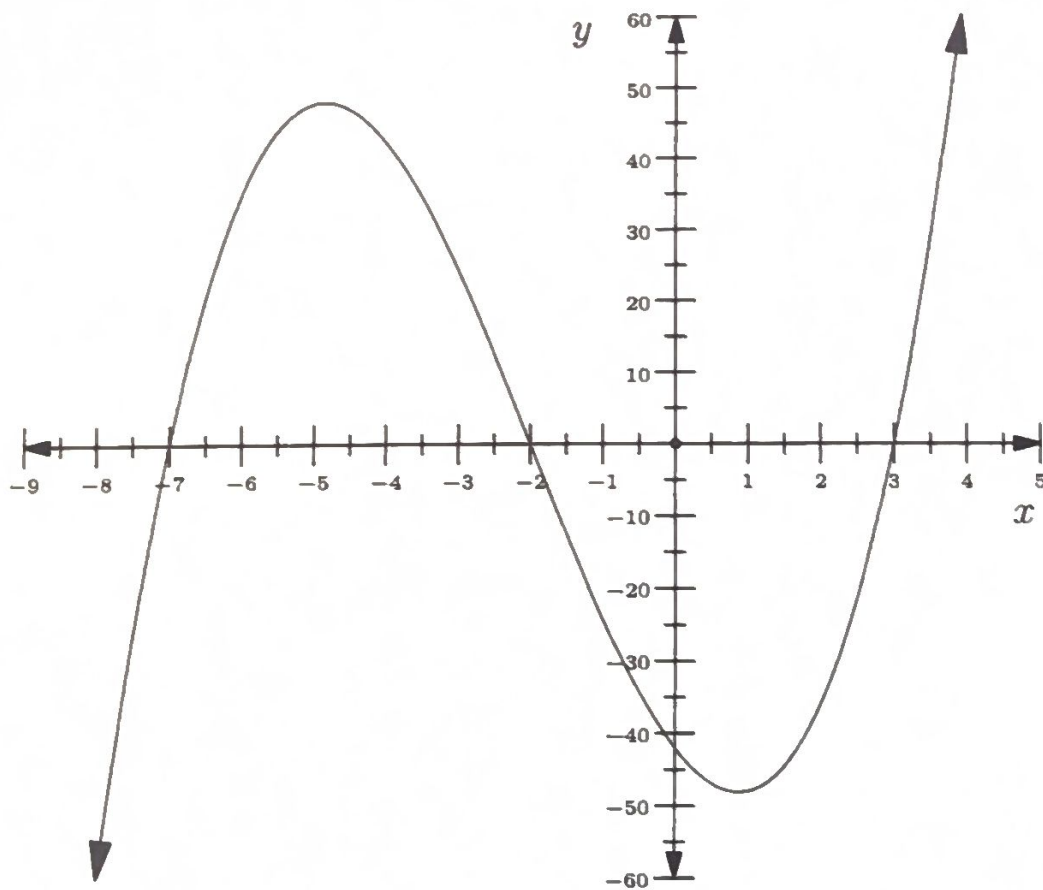
1. _____ In Heidi's history class, the only grades that count toward the semester average are the 6 tests she has already taken and the upcoming final exam. The final exam counts as two tests. Heidi has determined that if she earns 99 points on the final she will have exactly a 90-point average for the semester. On average, how many points has Heidi scored on each test prior to the final exam?
2. _____ What is the sum of the first 150 odd positive integers?
3. _____ A particular rectangle has length 7 units and perimeter 21 units. What is the ratio of its width to its length? Express your answer as a common fraction.
4. _____ In rectangle $ABCD$, the length of side AB is less than the length of side BC . When diagonal AC is drawn, and a line segment from vertex B to diagonal AC is drawn so that the segment meets AC at a right angle, rectangle $ABCD$ is divided into three regions whose areas form an arithmetic progression. The ratio $AB : BC$, expressed as a common fraction in simplest radical form, is $\frac{\sqrt{a}}{b}$. What is the value of ab ?
5. _____ If $f(x) = 5x - 3$, $g(x) = 3x^2 + 1$ and $h(x) = f(x) + g(x)$, what is the sum of the x -values for which $h(x) = 0$? Express your answer as a common fraction.
6. _____ Juan has 240 marbles. This is three times as many marbles as Jon and Jeremy have combined. If Jon has 50 marbles, how many marbles does Jeremy have?
7. _____ How many integers x satisfy $|13\pi x| < -\pi$?
Integers are positive and negative.
8. _____ When a positive integer is divided by 7, the result is 35 with a remainder of 5. What is the integer?
9. _____ A right triangle has two sides of length 5 units and 12 units. What is the number of units in the least possible length of the third side? Express your answer to the nearest whole number.

10. _____ A 9-inch x 12-inch rectangular picture is framed by a border of uniform width. The combined area of picture plus border is 180 in^2 . In inches, what is the width of the border? Express your answer as a decimal to the nearest tenth.



11. _____ The three angle measures of a triangle are $\frac{\pi}{2}$, $\frac{\pi}{3}$ and $\frac{\pi}{6}$ degrees. What is the degree measure of the smallest angle? (note: the question is not "what is x ?")

12. _____ Based on the graph of $f(x) = x^3 + 6x^2 - 13x - 42$, shown here, what is the sum of all x -values for which $f(x) = 0$?



13. _____ What is the smallest number of people you would need to have in a room if you wanted to be certain that at least 25 of them have the same birth month?
14. _____ Two real numbers have an average of 7. The average of their squares is 54. What is the product of the two numbers?
15. _____ Bill buys a 32 oz bottle of soda for 3 cents per ounce. Jill buys a 40 oz bottle of soda for 2.5 cents per ounce. How many more cents does Jill's bottle of soda cost?
16. _____ Working in pairs, Alana and Bob can complete a job in 2 hours, Bob and Cody can do the job in 3 hours, and Alana and Cody can do the same job in 4 hours. How many hours will it take for Alana, Bob and Cody working together to complete this job? Express your answer as a common fraction.
17. _____ Two similar right triangles have areas of 6 square units and 54 square units. The length of the hypotenuse of the smaller triangle is 5 units. What is the length, in units, of the hypotenuse of the larger triangle?
18. _____ What is the largest three-digit positive integer with exactly three positive factors?
19. _____ What percent of all three digit numbers contain the digit 5 at least once?
note: Not how many numbers, what percent?
20. _____ The sum of seven distinct positive integers is 91. What is the greatest possible value of the second largest of these integers?