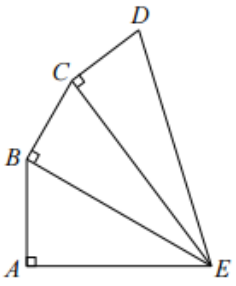
Set 1

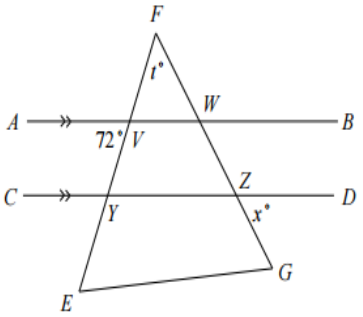
1. If x : 6 = 15 : 10, what is the value of x?
2. Let a be the largest positive integer so that a^3 is less than 999. Let b be the smallest positive integer so that b^5 is greater than 99. If $a - b = t$, what is the value of t?
3. Determine the positive integer a that satisfies 2 : m : 52 = m : 32 : a.

Go to locker number $a \times x + t^3 + 1$.

Set 2



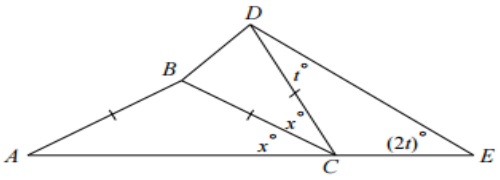
1. If $\frac{3(a+5)}{4} = 9 + \frac{3-3a}{2}$, what is the value of a?
2. In the diagram, ∠BAE = ∠CBE = ∠DCE = 90°. If AE = $\sqrt{5}$, AB = $\sqrt{4}$, BC = $\sqrt{3}$, and CD = $\sqrt{13}$, what is the length of DE?
3. In the diagram, line segments AB and CD are parallel. AB intersects EF at V and GF at W. CD intersects EF at Y and GF at Z. If ∠AVE = 72°, ∠EFG = t° = 56°, and ∠GZD = x°, what is the value of x?



Go to locker number $DE! \times x \div 6 + a^a$.

Set 3

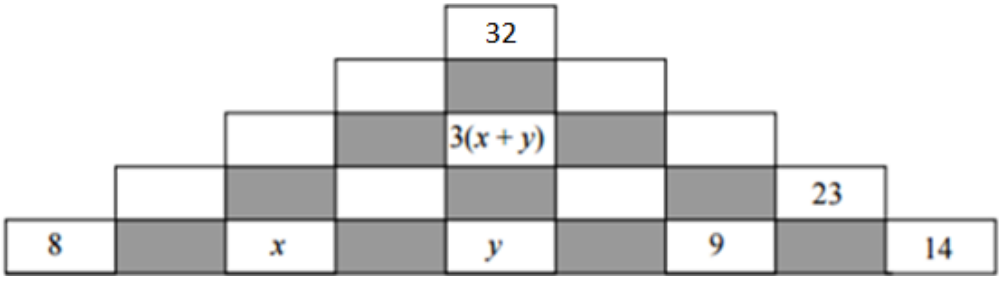
1. ΔABC has vertices A(−1, 2), B(5, 2) and C(−4, −3). What is the area of ΔABC?
2. A large theatre has 20 rows of seats. Each row after the first row contains 4 more seats than the previous row. If there are 3000 seats in total, and the number of seats in the first row is a, find a.
3. In the diagram, C lies on AE and AB = BC = CD. If ∠CDE = t° = 20°, ∠DEC = (2t)°, and ∠BCA = ∠BCD = x°, determine the measure of ∠ABC.



Go to room $\angle ABC \times a \div 6 - area^2 - 7$.

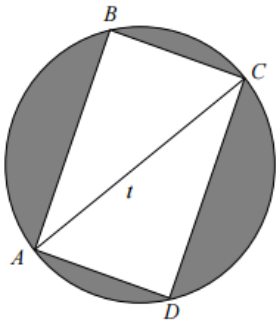
Set 4

1. What is the sum of the x-intercept of the line with equation 20x + 16y + 40 = 0 and the y-intercept of the line with equation 20x + 16y + 64 = 0?
2. In the diagram, the number that goes in each unshaded box above the bottom row is the sum of the numbers in the two unshaded boxes immediately below to the left and to the right. For example, 23 = 9 + 14. What is the value of x − y?

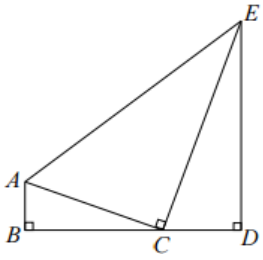


Go to locker number $(y)^{-(x-int)} \times |y - int|! - (y - int)^2(3\left(x - y + |y - int|^{\frac{3}{2}}\right))$.

Set 5



1. In the diagram, the vertices of rectangle ABCD lie on a circle. Diagonal AC is a diameter of the circle and has length t = 6. If CD = 2AD, find the area of the shaded region, and write your answer in the form $a\pi - \frac{b}{c}$ with a, b, c positive integers and with $\frac{b}{c}$ having no common positive divisor larger than 1.
2. Over the winter, Oscar counted the birds in his backyard. He counted three different types of birds: sparrows, finches and cardinals. Three-fifths of the birds that he counted were sparrows. One-quarter of the birds that he counted were finches. If Oscar counted exactly 60 cardinals, how many sparrows did he count?
3. In the diagram, point C is on DB, △ABC is right-angled at B, △ACE is right-angled at C, and △CDE is right-angled at D. Also, AB = 12, BD = DE = 54, and BC : CD = 2 : 1. If the area of △ACE is k, what is the value of 1/36 k?



Go to room $k + 4 \times sparrow - \frac{b}{c-0.5}$.

Answers

Set 1	Set 2	Set 3	Set 4	Set 5
1. 9	1. 3	1. 15	1. -6	1. 9π - 72/5
2. 6	2. 5	2. 112	2. 21	2. 240
3. 208	3. 52	3. 120°	Locker 1512	3. 30 (k = 1080)
Locker 2089	Locker 1067	Room 2008		Room 2024