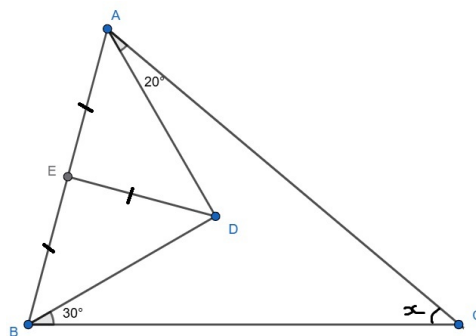
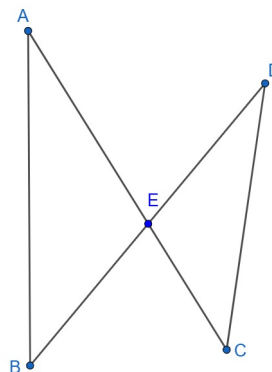


1. Consider the consecutive prime numbers between 1 and 100. Suppose there are m pairs of adjacent primes with a difference of 6. What is the value of $2m$?
2. Nine friends went to a party. All the boys drank only coffee, and all the girls drank only tea. The price of one cup of coffee (in rupees) is 2 less than the number of girls. The price of one cup of tea (in rupees) is 2 less than the number of boys. The total money spent by the boys and the girls is in the ratio 5 : 6. Find the cost of 10 cups of coffee.
3. If m and n are solutions of the quadratic equation $8x^2 - 25x + 18 = 0$, find the value of $8mn$.
4. In the following diagram (not to scale), D is in the interior of $\triangle ABC$. E is on $\overline{AB}$ such that $AE = BE = DE$. If $m\angle DAC = 20^\circ$, $m\angle DBC = 30^\circ$, and $m\angle ACB = x$, find x .



5. $P = \left(\frac{\sqrt[3]{64}}{\sqrt[3]{32}} \times \sqrt[4]{16} \right)^3$. Find P .
6. 10% of 20% of 40% of 50% of 80% of 15000 is?
7. The average age of a family of 4 is 22 years and 6 months. The son is 2 years older than his sister. The father is 4 years older than his wife. What is the average age of the mother and son?
8. $\left[\frac{8}{7} + \frac{7}{8} \right]^2 - \left[\frac{8}{7} - \frac{7}{8} \right]^2 = x$, find x^2 .
9. In the following diagram (not to scale), segments $\overline{AC}$ and $\overline{BD}$ intersect at E . If $m\angle BAE = m\angle ECD + 20^\circ$ and $m\angle CDE = 60^\circ$, find $m\angle ABE$.

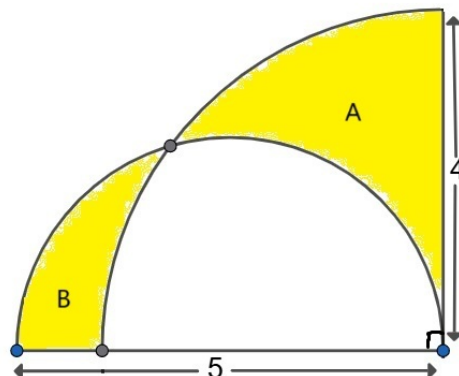


10. If y is a natural number that satisfies the equation below, then find y^2 :

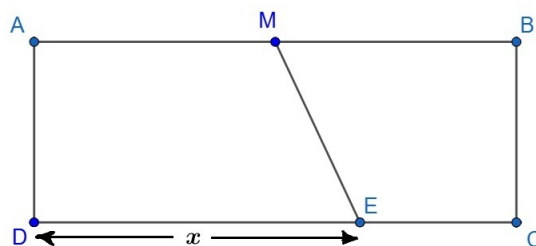
$$1 + \frac{y+3}{y-2} = \frac{3y-3}{6-y}$$

11. If a sum doubles in 80 months at simple interest, how many years will it take for the sum to become four times its original amount?
12. In a triangle, the largest angle is twice the measure of the second largest angle. One third of the largest angle is 10° more than the difference between the other two angles. Find one third of the largest angle.
13. If $a + b = 16$, $a^2 + b^2 = 130$, find the sum of the digits of $a^3 + b^3$.

14. A semicircle and a quarter circle are shown in the figure. The radius of the quarter circle is 4 and the diameter of the semicircle is 5. The shaded area A is inside the quarter circle but outside the semicircle. The shaded area B is inside the semicircle but outside the quarter circle. If $A - B = \frac{a\pi}{b}$, find $a + b$.



15. Let a , b , and c be numbers such that $ac = \frac{4}{b}$ and $b(a + c) + ac = 32$.
Find the value of $\frac{3}{a} + \frac{3}{b} + \frac{3}{c}$.
16. A two-digit number is four times the sum of its digits and twice the product of the digits. Find the number.
17. In rectangle $\square ABCD$, $AB = 24$, $BC = 18$.
 M is the midpoint of $\overline{AB}$. E is on $\overline{DC}$ at a distance x from D . Find x such that the area of $\square AMED$ is twice the area of $\square BMEC$.



18. $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = a - b\sqrt{15}$. Find $3(a - b)$.
19. Find natural number x such that: $\sqrt{x^2 + x + 17} = 17$
20. If 22 weavers weave 990 shawls in 15 days, how many weavers can weave 630 shawls in 21 days?