

Hustle Geometry Solutions

- The diagonals are perpendicular, so half of each diagonal forms the sides of a right triangle with one of the sides of the rhombus, so $\frac{d_1^2}{4} + \frac{d_2^2}{4} = 100$, thus $d_1^2 + d_2^2 = 400$
- $\pi(13^2 - 5^2) = 144\pi$
- This forms a cylinder of height four and base radius 2. The volume is thus 16π .
- This is an infinite geometric series: the first value is 16π , and the ratio is $\frac{1}{4}$ (because the area changes with r^2), so the sum is $\frac{16\pi}{1 - \frac{1}{4}} = \frac{64\pi}{3}$
- The hypotenuse of the triangle is 5; this is also the diameter of the circle due to the right angle. Thus, the area of the circle is $2.5^2\pi = 6.25\pi$
- The slope of the line is -2, and its y intercept is 6, so the equation is $y = (-2)x + 6$.
- $Volume = BH = \frac{s^2\sqrt{3}}{4} * 6 * H = 30\sqrt{3}$
- $Geometric\ Mean = \sqrt[3]{15 * 5 * 20} = \sqrt[3]{5^3 * 3 * 1 * 4} = 5\sqrt[3]{12}$
- The total angle between the hands is equal to the $\frac{1}{12}$ of the circle contained between 3 and 4, plus $\frac{2}{3} * \frac{1}{12}$ of the circle contained between 2 and 3. The sum is $\frac{5}{36}$, and $\frac{5}{36}$ of a circle is 50 degrees.
- The side length of the hexagon is 5, and thus its area is $\frac{s^2\sqrt{3}}{4} * 6 = \frac{75\sqrt{3}}{2}$
- $x^2 + y^2 = r^2$, so $x^2 + y^2 = 25$
- This forms a cylinder bent into a torus. Its volume is $BH = 4\pi * 2 * 5 * \pi = 40\pi^2$.
- The hypotenuse of the small triangle is 5, so the hypotenuse of the middle triangle is 13. Thus, $\sin \theta = \frac{7}{13}$
- The goat can graze in $\frac{3}{4}$ of a circle of radius 15, as well as $\frac{1}{4}$ of a circle of radius 5. The total area is thus $\frac{3}{4} * 225\pi + \frac{1}{4} * 25\pi = \frac{700\pi}{4} = 175\pi$
- The difference in your speeds is 1 mph, and you must catch up a distance of .5 miles. Thus, it will take you 30 minutes.
- $Volume = l * w * h = 4 * 6 * 2 = 48$
- $A = k * \frac{C}{B}$, so $10 = k * \frac{5}{2} \rightarrow k = 40$. Thus, $A = 40 * \frac{4}{1} = 160$
- From the slant height and half of the base side length, we make a right triangle with base length 4 and hypotenuse 8. Thus, the height of the pyramid is $4\sqrt{3}$, so the volume is $\frac{1}{3} * 64 * 4\sqrt{3} = \frac{256\sqrt{3}}{3}$
- The triangle can be split into a 45-45-90 triangle and a 30-60-90 triangle. The contribution to x from the 45-45-90 triangle is $\frac{10}{\sqrt{2}} = 5\sqrt{2}$, and the contribution from the 30-60-90 triangle is 4. Thus the total length of x is $4 + 5\sqrt{2}$
- The volume of the box is 720, and the volume of each cube is 8. The total number of cubes that will fit in the box is thus 90.
- The net rate of flow into the tank is 3.5 liter/minute. Thus, it will take $\frac{28}{3.5} = 8$ minutes for the tank to fill.
- The circumscribed square will have a side length of $2r$, and thus a diagonal length of $2\sqrt{2}r$. The ratio as a fraction will thus be $\frac{\sqrt{2}}{4}$.
- This is an infinite series, with first term of 1 and ratio of $-\frac{1}{3}$. The total sum is thus $\frac{1}{1 + \frac{1}{3}} = \frac{3}{4}$

24. The area is $\frac{1}{2} * (b_1 + b_2) * h = \frac{1}{2} * (x + 1 + 2x - 1) * \frac{3}{x} = \frac{1}{2} * 3x * \frac{3}{x} = \frac{9}{2}$

25. Total area to paint is $2 * (2 * 4) + 2 * (2 * 5) = 36$ square meters. This will require 6 gallons of paint, so \$60.