

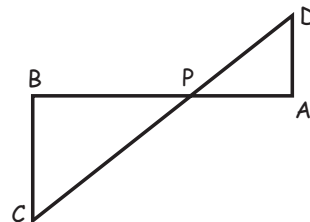


Warm-Up 14

1. _____ In base b , $321 - 123 = 154$. What is the value of b ?

2. _____ What is the value of n if $4(3^{n+2}) + 45(3^n) = 3$?

3. _____ cm In the figure shown, $\overline{AD} = 4$ cm, $\overline{BC} = 8$ cm and $\overline{CD} = 20$ cm. Also, $\overline{AD} \perp \overline{AB}$ and $\overline{BC} \perp \overline{AB}$. What is the length of \overline{AP} ? Express your answer as a common fraction.



4. _____ A rectangle with sides of length 5 units and 6 units that are parallel to the x -axis and y -axis has one vertex at $(1, 3)$. What is the largest possible sum of the coordinates of any of the other vertices of this rectangle?

5. _____ What is the units digit of N in the following equation? $\frac{3 \times 3 \times 3 \times 3 \times 3}{N} = \frac{1}{2} \times \frac{1}{3} \times \frac{1}{3}$

6. _____ tricycles The cycle shop sells only bicycles and tricycles. All the bicycles have two wheels and all the tricycles have three wheels. If you add up the total wheels on the 67 cycles in the shop, you get 157 wheels. How many tricycles are in the shop?



7. _____ cm² If $ABCDEFGH$ is a regular octagon with sides of length 2 cm, what is the area, in square centimeters, of triangle ABC ? Express your answer in simplest radical form.

8. _____ minutes Running at 12 miles per hour burns about 1200 calories per hour. Running at 5 miles per hour burns about 450 calories in an hour. How many minutes longer does one have to run to burn 300 calories at 5 miles per hour than at 12 miles per hour?



9. _____ students Of the 2000 students in Houston High School, 70% are male. How many male students must be moved to another school so that 60% of the Houston High student body will be males?

10. _____ Suppose that six brothers (George, John, Thomas, Fred, Andrew, Martin) each roll a fair 6-sided die. At least three of them have rolled an even number. What is the probability that John, Fred and Martin have each rolled an even number? Express your answer as a common fraction.