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of $\frac{1}{16}$ of an inch in diameter; it is required to determine the length of the said wire, allowing no loss in the metal?

Ans. 55 $\frac{1}{2}$ miles.

28. How many shot are there in an unfinished oblong pile, the length and breadth of whose base being 48 and 30, and the length and breadth of the highest course being 24 and 6?

Ans. 17356.

29. How many shot are there in an unfinished oblong pile of 12 courses; length and breadth of the top contain 40 and 10 shot respectively?

Ans. 8606 shot.

30. Of what diameter must the bore of a cannon be cast for a ball of 24 pounds weight, so that the diameter of the bore may be $\frac{1}{16}$ of an inch more than that of the ball?

Ans. 5.757098 inches.

31. What is the content of a tree, whose length is 17 $\frac{1}{2}$ feet, and which girths in five different places as follows, viz., in the first place 9.43 feet, in the second 7.92, in the third 6.15, in the fourth 4.74, and the fifth 3.16?

Ans. 42.5195.

32. What three numbers will express the proportions subsisting between the solidity of a sphere, that of the circumscribing cylinder, and circumscribing equilateral cone?

Ans. 4, 6, 9.

33. Given the side of an equilateral triangle 10, it is required to find the radii of its circumscribing circle?

Ans. 5.7736.

34. Given the perpendicular of a plane triangle 300, the sum of the two sides 1150, and the difference of the segment of the base 495; required the base and the sides?

Ans. 945, 375, and 780.

35. A side wall of a house is 30 feet high, and the opposite one 40, the roof forms a right angle, at the top, the lengths of the rafters are 10 feet and 12; the end of the shorter is placed on the higher wall, and *vice versâ*; required the length of the upright, which supports the ridge of the roof, and the breadth of the house?

Ans. 41.803, length of upright, and 12 feet the breadth of the house.