

a height of wave of 36 feet; Capt. Wilkes, U. S. N., writes of 32 feet in the Pacific, and Sir J. Ross of 22 feet in the South Atlantic. Heights of waves in N. W. gales off the Cape of Good Hope were computed at 40 feet, those off Cape Horn at 32 feet, in the Mediterranean Sea at 14 feet 10 inches, and in the German Ocean at 13½ feet; but in British waters they are only found to average 8 to 9 feet. The velocity of ocean storm waves was observed by Dr. Scoresby in the North Atlantic to be about 32 miles per hour; Capt. Wilkes recorded it at 26½ miles in the Pacific, and French sailors in the Bay of Biscay at 60 miles an hour. Dr. Scoresby has estimated the distance between or breadth of his Atlantic storm waves at about 600 feet from crest to crest, which is only about half of that stated in the letter, and with a proportion of only 1-20th for height to breadth. Dr. Scoresby states that his waves of 30 feet in height move at the rate of 32 miles per hour."

Steel telegraph wires covered with copper are now prepared by tinning steel, and then covering it with copper tinned on one side. The united metals are then drawn into wire, and in the heat developed in passing the wire through the draw-bench, the tin is fused and quickly solders the copper covering to the steel core. The finished wire resists rust, weighs one-third less than common telegraph wire, and is said to be a better conductor, while it has greater tensile strength. In this wire the steel merely serves for strength, and the copper for protection and conduction.—*Ex.*

Every one is familiar with the blanching of grass under stones, or of celery, sea kale and rhubarb when grown in the dark; but it is remarkable that as a rule this "etiolation," as it is termed, does not extend to the flower. Their petals will acquire their color in the dark, while their normally green calyx is blanched like the leaves. There is, however, at least one exception to this rule in the white lilac obtained by the Paris florists, by forcing the colored kinds into almost complete darkness.

Mathematical Department.

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Teachers and others are invited to forward any problems they may think worthy of a place in these columns, provided always that the solutions accompany the problems.

Send Solutions before 15th inst., to receive attention, and address the Editor as above.

When sending solutions, correspondents will please send each month's problems separately.

The names of those who solve the several problems correctly will be published with the solutions thereof.

The solutions of all problems published in this department will be printed in the second number following that in which the problems appear.

Problems.

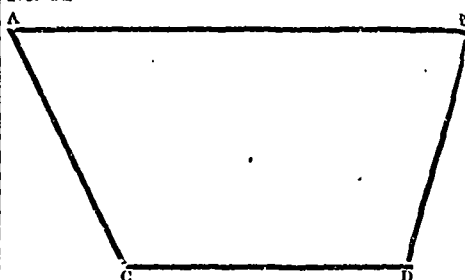
No. 42.—

Two persons, A and B, can perform a piece of work in 16 days. They work together for 4 days, when A being called off, B is left to finish it, which he does in 36 days more. In what time would each do it separately? By Arithmetic.

No. 43.—

$$\frac{\sqrt{c} - \sqrt{c-x}}{\sqrt{c} + \sqrt{c-x}} = c, \text{ to find the value of } x.$$

No. 44.—



A farmer has a field in the form of the above figure ABCD. AB and CD are parallel, and are respectively 100 and 160 rods; AC is 90 and BD 80 rods. He sells the field for \$40 per acre. How much money does he receive?

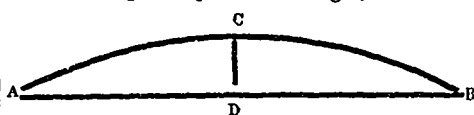
No. 45.—Proposed by John Anderson, Dixie, Ont.

Two trains travelling, one at 20 miles an hour, the other faster, came into collision at a level crossing, where the two lines (both being free from curves) cross each other at an angle of 36°. Some time before the collision, a passenger in the slower train observes the other exactly abreast of him on the other line of railway, and judges the trains to be a quarter of a mile apart. How far from the crossing were both trains at that moment, and what was the speed of the faster train?

No. 46.—Proposed by G. W. Priest, Ayr, Ont.

A merchant has a quantity of coffee on which he wishes to gain 37½%. After selling three-fifths at this gain he is obliged to reduce the price two cents per pound, and finds after selling it that he has gained only 1½% of what he had desired. What did the coffee cost him?

No. 47.—Proposed by A. S. McGregor, Avonbank.



ABCD is a segment of a circle, whose chord AB is 120 feet, and the verse sine CD 1 foot. Find the diameter of the circle.

No. 48.—Proposed by H. T. Scandamore.

Two equal inelastic bodies move in the same vertical line, the 1st upward with an initial velocity against the force of gravity, and the 2nd downward from rest with the force of gravity. After impact their united motion just brings them to rest at the point from whence the second started. What are their comparative velocities at the time of impact?

No. 49 — Proposed by W. J., engineer, Garden Island.

(a) What power of steam will raise a safety-valve 4 inches in diameter, held down by a weight of 50 pounds at the end of a lever which has a leverage as 5 to 1?

(b) How far apart each way should ½ inch stay bolts be placed in the flat surface of a boiler to carry 60 pounds per square inch—supposing a ½ stay bolt is equal to a pressure of 3607 pounds.