

and 4 yards respectively. What is the longest right line that can be taken within that room?

(28) What must be the length of a cord with which a horse may be tethered to a certain point in a straight fence, so as to allow him the liberty of grazing to the extent of 1 rood, supposing that he can reach 2 yards beyond the tether?

(29) A person playing at cards, lost three nights successively. The first night he lost half his sovereigns and half a sovereign besides; the second night he lost half the remainder and half a sovereign more; and the third night half the remainder and half a sovereign more, which reduced his stock to twenty. How many sovereigns had he at first?

(30) The month of July, 1828, was remarkable, both in England and several parts of the Continent, for excessive rains. At Derby, the quantity collected in the *pluviometer* (or rain-gauge), between the hours of *nine*, A. M., of the 9th of that month and *six* the following morning (an interval of 21 hours) was 3.59 inches; to the evening of the 15th it amounted to 7½ inches; and by the conclusion of the 29th, an interval of 21 days, of which 10 only were very rainy, the total depth of water collected was 11½ inches. How many hogsheads, of 54 and 63 imperial gallons respectively, fall on an acre of ground to amount to the depth of *one inch*; and how many hogsheads of each kind fell on the surface of an acre during each of the three several intervals above mentioned?

(31) A person who occupies a piece of ground for which he pays a rent of £10. per annum, wishes to take it upon a lease for forty years, with the obligation of laying out upon it during the present year £600. in the erection of a building, which is to be left in good tenantable condition at the termination of the lease. The question is, how much will be a fair annual rent for the lessee to pay during the term of continuance of such tenure, admitting the ground rent paid at present to be a fair one, and supposing the customary interest of money to be at the rate of £5. per cent. per annum? Also, supposing interest to be at £4. per cent. per annum?

(32) What will be the expense of covering and guttering a roof with lead at 18s. *per cut.*, the length of the roof being 43 feet, and the breadth or girt over it 32 feet; the guttering 57 feet long and 2 feet wide: the lead for the former being 9.831 *lb.*, and for the latter 7.373 *lb.* to the square foot?

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