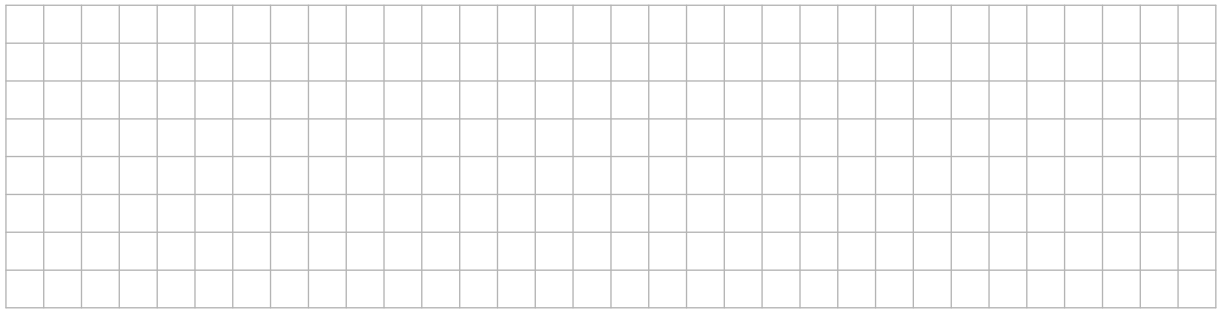
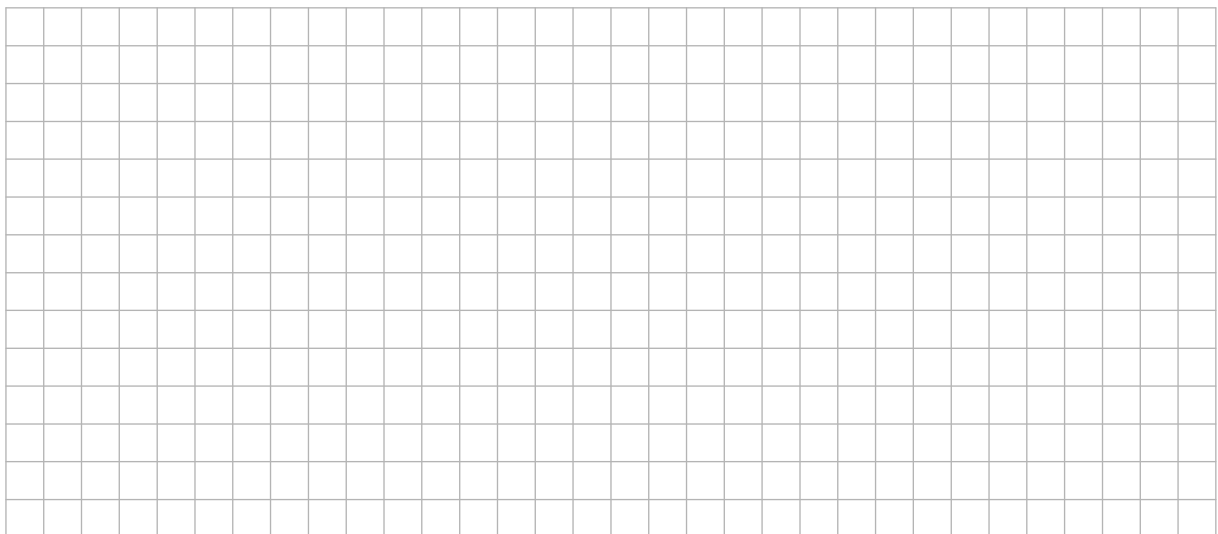


- (c) The other metals in the gold alloy are copper and silver. The colour of the alloy depends on the ratio of copper to silver. In all of the old jewellery, the amount of silver is equal to the amount of copper. The jeweller has a stock of pure silver that he can add to any mixture. He wants to make an item that:
- weighs 48 grams
 - is of 15-carat gold purity
 - has twice as much silver as copper.

(i) How many grams of copper will this item contain?

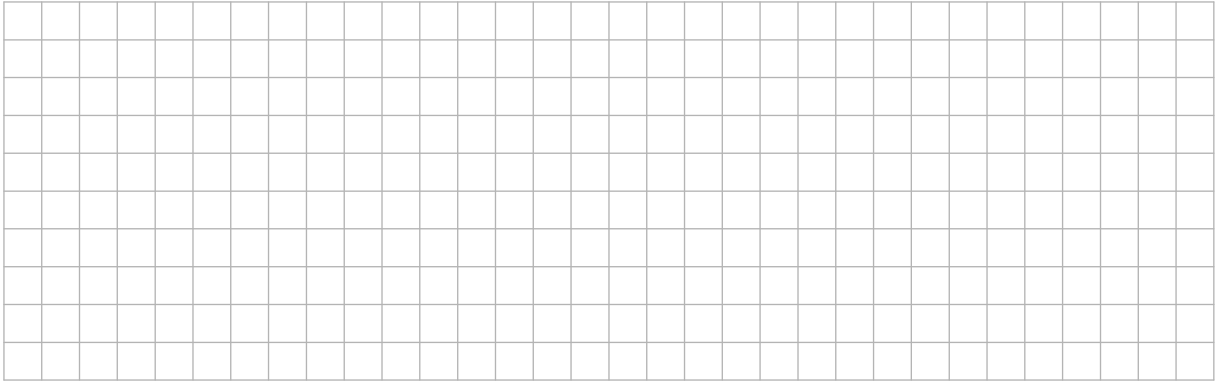


(ii) How many grams of each type of stock (9-carat gold, 18-carat gold, and pure silver) should the jeweller use in order to make this item?



There is some more space for work on the next page.

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- (d)** A large jewellery business makes and sells 14-carat gold wedding rings, weighing an average of 5 grams each. The cost of producing each ring is €135 plus the value of the gold. The manager has noted that the more they charge for the rings, the fewer they sell. In particular:
- if they charge €200, they sell an average of twenty per month
 - for each additional €20 charged, the number sold drops by one per month.
- (i)** Taking the price charged as €(200 + 20 x), find an expression in x for the monthly profit from these rings.



- (ii)** Find the range of selling prices for which the monthly profit is at least €1600.

