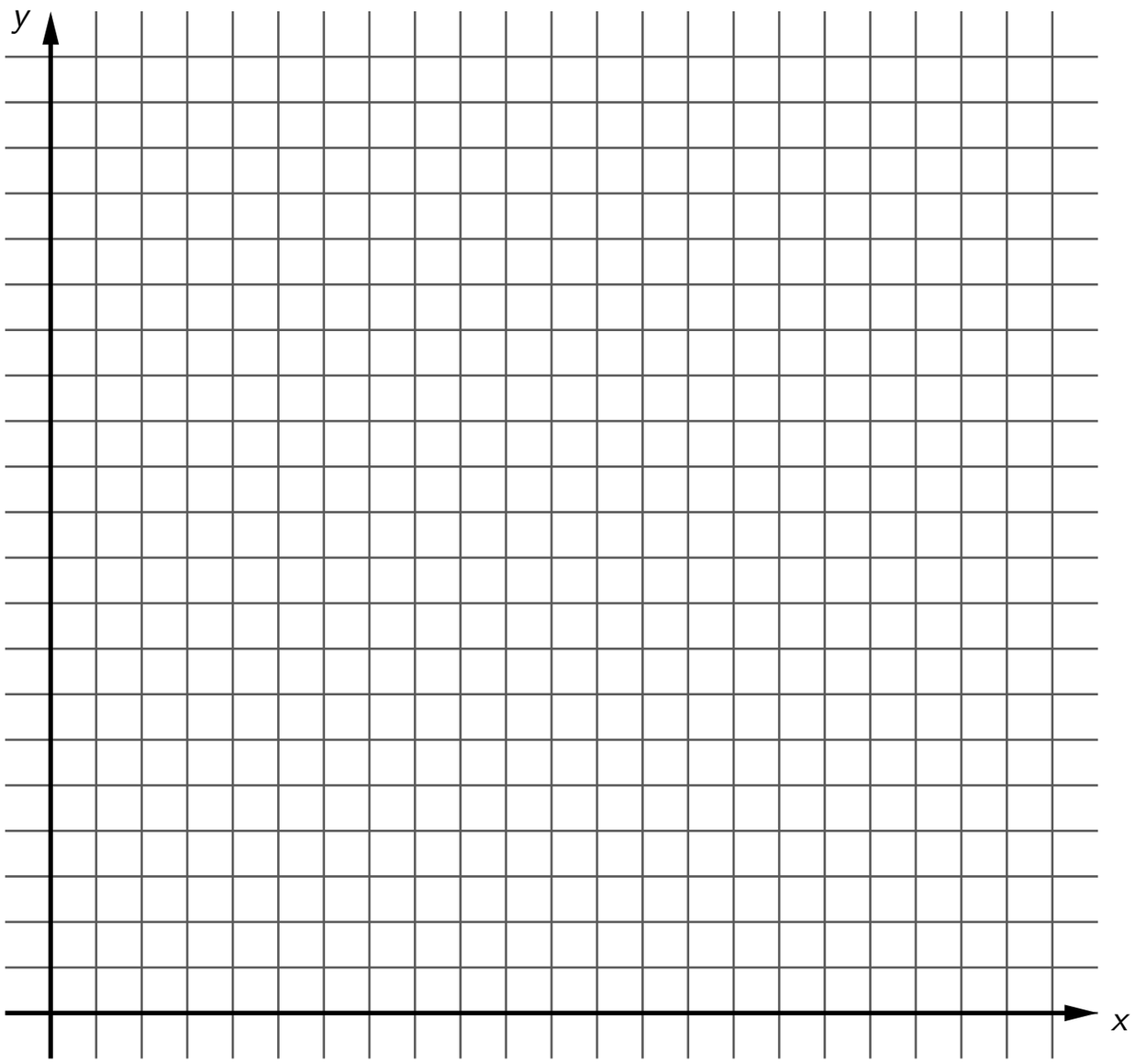
**Question 1:** A hobby farmer raises goats and pigs. He wants to raise no more than 16 animals in total, of which at most 10 can be goats. It costs $25 to raise a goat and $75 to raise a pig, and the farmer has $900 available for the project. Each goat produces $12 in profit and each pig $40 in profit. How many of each animal should the farmer raise to maximize total profit?

Graph paper is provided on the next page. Carefully set up the problem, identify your variables, neatly sketch equired graphs and state a clear conclusion.

**[10]**

Graph for **Question 1:**



**Question 2:** What amount must be invested at 7.5% compounded quarterly to have $3000 in three years time? (Round your final answer to 2 decimal places.)

**[3]**

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**Question 3:** A person gets a payday loan of $1500 which must be repaid in two weeks along with a fee of $100. What rate of simple interest is being charged? (State your answer as a percentage rounded to 2 decimal places.)

**[3]**

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**Question 4:** What rate of interest compounded monthly is equivalent to an effective rate of 5%? (State your answer as a percentage rounded to 2 decimal places.)

**[4]**

**Question 5:** What rate of interest compounded quarterly will result in an investment tripling in 12 years? (State your answer as a percentage rounded to 2 decimal places.)

**[3]**

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**Question 6:** Which investment is better: one that pays 7.5% interest compounded monthly or one that pays 7% compounded continuously?

**[4]**

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**Question 7:** How long does it take \$100 invested at 8% compounded semiannually to increase to \$300? (Round your answer to the nearest year.)

**[3]**

**Question 8:** \$200 is deposited at the end of each month into a retirement fund earning 5% compounded monthly. How much is in the fund at the end of 45 years? (Round your final answer to the nearest dollar.)

**[5]**

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**Question 9:** An investor wishes to accumulate \$1,000,000 over 40 years by making annual payments into a fund earning 7% compounded annually. The payments for the first 20 years will be of size $P$ while those of the second 20 years will be of size $2P$. Determine $P$. (Round your final answer to 2 decimal places.)

**[5]**

**Question 10:** Parents of a newborn wish to save \$30,000 by the child's eighteenth birthday to pay for college. All deposits will be made to a fund earning 8% compounded annually. If \$5000 is deposited when the child is born, what must be the equal deposits made at the end of each year up to and including the child's eighteenth birthday in order to reach the savings goal? (Round your final answer to the nearest dollar.)

**[5]**

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**Question 11:** A worker begins his new job on January 1 and makes \$3000 deposits to his pension fund every six months for his working lifetime. When he retires he has \$1,097,642 in his fund. If the fund earns 6% compounded semi-annually and the worker works a whole number of years, how many years did he work? (Round your answer to the nearest year.)

**[5]**