f (x) = g (x)

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(1) Ms. Piche offers a Takis Pass, where you can pay her $19 up front, and then pay her $1 per bag. Ms. Oliver offers a similar pass, where you only pay her $8 up front, but then you pay her $2 per bag.

     (a) Write an equation to describe the cost (y) of each pass in terms of bags (x) bought.
     (b) Determine how much you would be paying for each pass after 3 bags.
     (c) Determine how much you would be paying for each pass after 5 bags.
     (d) Which pass should you choose if you plan on buying 10 bags?
     (e) How much money would you save by choosing this cheaper option?
     (f) Determine when you would be paying the same amount for each pass.

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(2) Restaurant A offers a milkshake pass where you pay $3 for the card and each milkshake costs you $2. Restaurant B offers a similar pass where you pay $9 for the card but each milkshake is only $1.

     (a) Write an equation to describe the cost (y) in terms of milkshakes (x) bought.
     (b) Determine how much you would be paying for each pass after 4 milkshakes.
     (c) Determine how much you would be paying for each pass after 7 milkshakes.
     (d) Which pass should you choose if you plan on buying 12 milkshakes?
     (e) How much money would you save by choosing this cheaper option?
     (f) Determine when you would be paying the same amount for each pass.

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(3) A video game rental service charges $40 plus $20 per game. Their rival company charges $20 plus $30 per game.

     (a) Write an equation to describe the cost (y) in terms of games rented (x).
     (b) Determine how much you would be paying for each service after 1 game.
     (c) Determine how much you would be paying for each service after 3 games.
     (d) Which pass should you choose if you plan on renting 5 games?
     (e) How much money would you save by choosing this cheaper option?
     (f) Determine when you would be paying the same amount for each service.
     (g) When is the only time that Option 2 would be better?

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(4) Netflix offers two subscriptions for their streaming services. Option A charges users $9 up front and then $4 every month. Option B charges $18 up front, but just $3 every month.

     (a) Write an equation to describe the cost (y) in terms of months (x).
     (b) Determine how much you would be paying for each service after 2 months.
     (c) Determine how much you would be paying for each service after 6 months.
     (d) Which pass should you choose if you plan on using Netflix for 1 year?
     (e) How much money would you save by choosing this cheaper option?
     (f) Determine when you would be paying the same amount for each option.
     (g) How long would it take for you to reach a $100 bill for each option?

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(5) BurgerUp offers a Burger Pass where you can pay $4 to get the pass, and each burger costs $6. Another restaurant, Flip Burger, tried a different approach: they charged $24 for the pass but only charged $2 for each burger.

      (a) Write an equation to describe the cost (y) in terms of burgers (x) bought.
      (b) Determine how much you would be paying for each pass after buying 4 burgers.
      (c) Determine how much you would be paying for each pass after 8 burgers.
      (d) Which pass should you choose if you plan on eating 1 burger per month for 1 year?
      (e) How much money would you save by choosing this cheaper option?
      (f) Determine when you would be paying the same amount for each pass.
      (g) Suppose that, if you commit to eating 10 burgers, BurgerUp will give you a 30%
           discount. Compare the prices of each pass after 10 burgers.

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(6) Antioch's library offers a book subscription plan, where you can pay $3 at the start of the year and then $6 for each book that you purchase throughout the year. Downtown's library charges $15 at the beginning of the year, but each book only costs $3.

      (a) Write an equation to describe the cost (y) in terms of books (x) bought.
      (b) Determine how much you would be paying for each pass after 2 books.
      (c) Determine how much you would be paying for each pass after 9 books.
      (d) Which pass should you choose if you plan on buying 10 books?
      (e) How much money would you save by choosing this cheaper option?
      (f) Determine when you would be paying the same amount for each pass.
      (g) If you buy 20 books at Antioch's library, you get a 30% **discount**. How much would
           you pay with this discount?
      (h) If you buy 20 books at Downtown's library, they **increase** the price by 10%. How
           much would you pay with this increase?
      (i) If the changes in (g) and (h) applied, which would be the better option for 20 books?

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(7) Mr. Lanham starts off the year by planting 8 trees and promises to plant 6 more trees each month. Ms. Van Loon starts off by planting 36 trees and will plant 2 more trees each month.

      (a) Write an equation to describe the number of trees (y) in terms of months passed (x).
      (b) Determine how many trees would be planted by each teacher after 3 months.
      (c) Determine how many trees would be planted by each teacher after 5 months.
      (d) Which teacher will have planted more trees after 1 year?
      (e) What is the difference in the number of trees planted after 1 year?
      (f) Determine when the same number of trees would be planted.
      (g) When will Mr. Lanham have planted **twice as many** trees as Ms. Van Loon?

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