Honors Pre-calculus: Linear Equations, Breakeven Points Worksheet

1. (a) Bally Fitness charges a flat fee of $25.00/month.
   (b) Gold’s Gym charges $10.00/month plus $2.00/visit.

Write equations to model each pricing scheme. Use \( x \) for the number of visits per month.
(a) \( y = 25 \)  
(b) \( y = 10 + 2x \)

Graph these equations on your calculator.
What is the breakeven point? (7, 5, 25)
What does this point mean in words applicable to this problem?
Under what circumstances would you recommend Gold’s Gym?

2. (a) Xerox charges $100.00/month plus 2¢/copy for its copiers.
   (b) Savin charges $70.00/month plus 2.5¢/copy.
   (c) Minolta charges $50.00/month plus 3¢/copy.

Write equations to represent each pricing arrangement. Use \( c \) for the number of copies.
(a) \( y = 100 + 0.02c \)  
(b) \( y = 70 + 0.025c \)  
(c) \( y = 50 + 0.03c \)

What are the breakeven points between: 
Xerox and Savin (6000, 220)
Xerox and Minolta (5000, 200)  
Savin and Minolta (4000, 170)?

What does the breakeven point between Xerox and Savin mean in words applicable to this problem?
If you make 6000 copies/month the cost for Xerox or Savin is the same $220.00

When would you recommend Xerox? 6000 or more copies/month
When would you recommend Savin? between 4000 & 6000 copies/month
When would you recommend Minolta? 4000 or less copies/month
3. (a) Blockbuster charges $20.00/month plus $1.25/movie rental.
(b) Video City charges $15.00/month plus $2.00/movie rental.
(c) Winchester Movie House charges a flat fee of $40.00/month for movie rentals.

Write equations to represent each pricing arrangement. Use m for the number of movies.

(a) \( y = 20 + 1.25m \)  \hspace{1cm} (b) \( y = 15 + 2m \)  \hspace{1cm} (c) \( y = 40 \)

What are the breakeven points between: Blockbuster and Video City \( (6.6, 28.3) \)
Video City and WMH \( (12.5, 40) \)  \hspace{1cm} Blockbuster and WMH \( (16, 40) \)?

What does the breakeven point between Blockbuster and Video City mean in words applicable to this problem? If you rent 6.73 movies on average per month, BC and VC charge the same \( 28.3 \)
When would you recommend Blockbuster? \( 6.73 \leq m \leq 16 \)
When would you recommend Video City? \( \leq 6.73 \) movies
When would you recommend WMH? \( \geq 16 \) movies/month

[Diagram showing the breakeven points for Blockbuster (BB), Video City (VC), and Winchester Movie House (WMH)]
4. (a) Blockbuster charges $20.00/month plus $1.25/movie rental.
   (b) Video City charges $12.00/month plus $1.85/movie rental.
   (c) Winchester Movie House charges a flat fee of $36.00/month for movie rentals.

Write equations to represent each pricing arrangement. Use \( m \) for the number of movies.
(a) \( y = 20 + 1.25m \)  
(b) \( y = 12 + 1.85m \)  
(c) \( y = 36 \)

What are the breakeven points between:  
Blockbuster and Video City \((13, 3, 36, 6)\)  
Video City and WMH \((12.97, 36)\)  
Blockbuster and WMH \((12.8, 36)\)?

What does the breakeven point between Blockbuster and Video City mean in words applicable to this problem?  
If you average 13.3 movies per month, both BC & VC charge the same $36.67.

When would you recommend Blockbuster?  

ever

When would you recommend Video City?  

each month

When would you recommend WMH?

5. (a) Xerox charges $100.00/month plus 3¢/copy for its copiers.
   (b) Savin charges $140.00/month plus 2.5¢/copy.
   (c) Minolta charges $175.00/month plus 2¢/copy.

Write equations to represent each pricing arrangement. Use \( c \) for the number of copies.
(a) \( y = 100 + 0.03c \)  
(b) \( y = 140 + 0.025c \)  
(c) \( y = 175 + 0.02c \)

What are the breakeven points between:  
Xerox and Savin \((8000, 340)\)  
Xerox and Minolta \((7500, 325)\)  
Savin and Minolta \((7000, 315)\)?

What does the breakeven point between Xerox and Savin mean in words applicable to this problem?  
If you make 8000 copies per month, on average, both Xerox & Savin will charge $340.90.

When would you recommend Xerox?  

\( \geq 8000 \) copies/month

When would you recommend Savin?  

\( \leq 8000 \) copies/month

When would you recommend Minolta?  

\( \geq 7500 \) copies/month