**Mathematics 9**

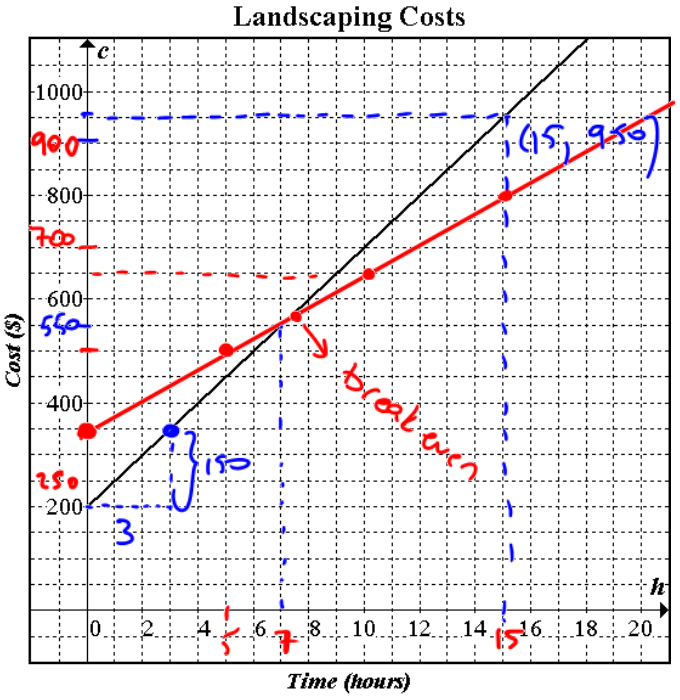
# Mr. Choi's Garden

**Date:**

Mr. Choi wants to hire a company to do some landscape work in his backyard. *Pete's Professional Pruners* charge a basic fee of $200 plus an hourly rate. The graph shows a relationship between cost, *c*, and number of hours worked, *h*.

Pete's Professional Pruners

$C = 50h + 200$



a) Using the graph, how much would it cost if the job lasted 7 hours? $550

b) Determine an equation that represents the relationship between cost (*c*) and the number of hours (*h*). $C = 50h + 200$

c) Using the graph, determine the number of hours of work that Mr. Choi would receive if he pays Pete $950. 15 hours

d) A second company, *Louis' Landscapers*, charges a base fee of $350 and an hourly fee of $30. Give the equation for this company. $C = 30h + 350$

| x | y |
|---|---|
| 5 | 500 |
| 10 | 650 |
| 15 | 800 |

e) Add the line for *Louis' Landscapers* to the above graph.

f) Determine the 'break-even' point using the graph. *(A decimal answer is permitted.)* (7.5, 575)

g) Interpret (explain the meaning) of the break-even point.

Two companies will cost you the same amount for 7.5 hours of work

h) Use an algebraic approach to find the break-even point and thus verify your answer to (f). *(A decimal answer is permitted.)*

The break-even point is the point of intersection where the graphs (equations) have the same x and y coordinates.

equation ① = equation ②

$50h + 200 = 30h + 350$

$50h - 30h = 350 - 200$

$\frac{20h}{20} = \frac{150}{20}$

$h = 7.5$

Sub 7.5 for "h" in any equation

$C = 30h + 350$

$= 30(7.5) + 350$

$= 225 + 350$

$= 575$

∴ If they work for 7.5 hours, they'll charge $575 each.

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