Math 4SN **Name:** _____

Greatest Integer Function Practice

1.

Johnny rents his camper to Sylvia and Benny under the following terms: the first 500 km are free, but each additional 100 km they travel will cost $20.

a) Find the rule for the greatest integer function that represents this arrangement. _____

b) How much must Sylvia and Benny pay Johnny if they travel 4174 km in his camper? _____

2.

A telephone company offers a promotion on long-distance calls made on Sundays. It charges customers 25¢ for the first 5 min and 10¢ for each additional minute.

a) Find the rule for the greatest integer function that calculates the cost of a long-distance call made on a Sunday.

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b) Last Sunday Joanne made a long-distance call that lasted 58 min 40 s. How much will this call cost before taxes?

_____

3.

A store manager offers his employees a base commission of $50, which he will increase by $25 for every $1000 worth of merchandise they sell over a one-month period.

a) Find the rule for the greatest integer function the manager uses to calculate the total commission he will pay each of his salesclerks.

_____

b) Hector sells $6257 worth of merchandise during the month. How much commission will he earn? _____

c) How much must an employee sell to earn a commission of $350?

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4.

Find the range of each of the following functions:

a) $f(x) = -0.5[x - 2] + 5$

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b) $g(x) = \left[\frac{x}{10}\right] + 25$

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c) $h(x) = 5[x + 3] - 5$

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5. For each of the following functions:

a) Sketch

b) Determine the zeros

c) Evaluate $f(-1)$

d) Evaluate $f(-12)$

e) Solve for when $f(x) = 10$

i) $f(x) = -3\left[\frac{5-x}{4}\right] + 1$

ii) $f(x) = -2\left[-\frac{1}{4}(x-4)\right] + 1$

iii) $f(x) = -3[0.1x - 0.5] - 6$

iv) $f(x) = \frac{1}{2}\left[\frac{3-x}{8}\right] + 5$

Answers

1. a) $y = -20[-1/100(x-500)]$, $x \geq 500$ b) \$740

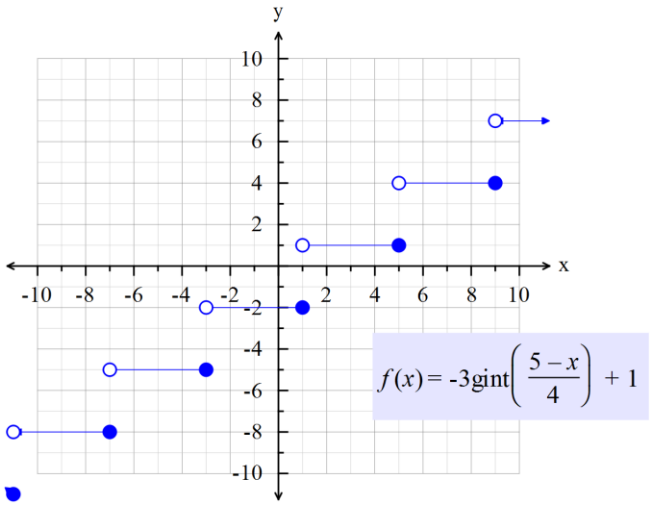
2. a) $y = -0.10[-(x - 5)] + 0.25$, $x \geq 5$ b) \$5.40

3. a) $y = 25[1/1000(x)] + 50$, $x \geq 0$ b) \$200 c) [\$12 000, \$13 000[

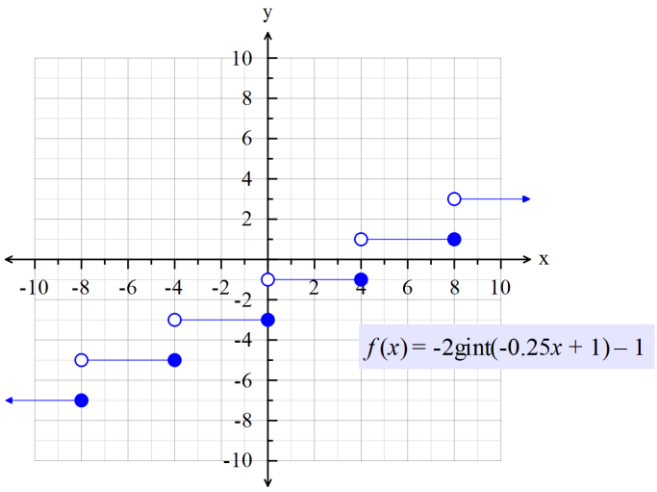
4. a) $\{y \mid y = ½ n, n \in \mathbb{Z}\}$ b) $\{y \mid y \in \mathbb{Z}\}$ c) $\{y \mid y = 5n, n \in \mathbb{Z}\}$

5.

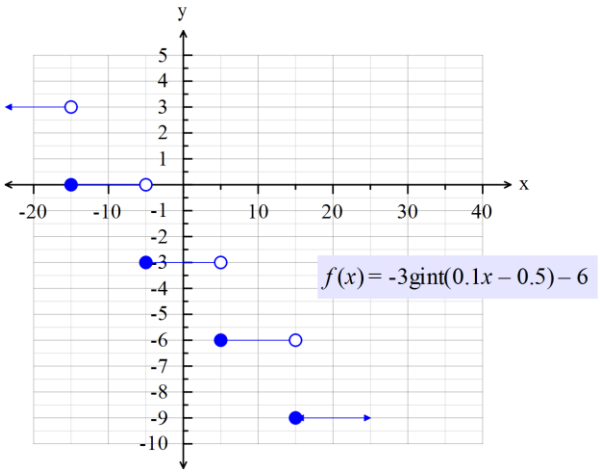
i) a) see below b) no zeros c) $f(-1) = -2$ d) $f(-12) = -11$ e) $x =]13, 17]$



ii) a) see below b) no zeros c) $f(-1) = -3$ d) $f(-12) = -11$ e) *no solution*



iii) a) see below b) [-15, -5[c) $f(-1) = -3$ d) $f(-12) = 0$ e) *no solution*



iv) a) see below b) $x =]75, 83]$ c) $f(-1) = 5$ d) $f(-12) = 5\frac{1}{2}$ e) $x =]-85, -77]$