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Unit 6 Study Guide: Expressions, Equations & Inequalities

1. Beth got a \$75 gift card to an online music store. She uses the gift card to buy an album for \$14.95. She also wants to use the gift card to buy some singles. Each song costs \$1.99. Write an inequality that describes this situation, where s is the number of songs to buy?

ME
RG
EF
OR

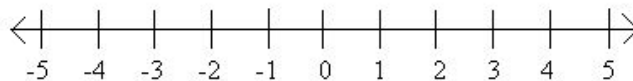
2. Select all expressions that are equivalent to $7x + 2 - (4x - 2)$.

- a. $7x + 2 - 4x - 2$
- b. $7x + -4x + 2 + 2$
- c. $3x + 4$
- d. $7x - 4x + 2 - 2$
- e. $7x + 2 + -4x - -2$

3. At midnight, the temperature in a city was 5 degrees Celsius. The temperature was dropping at a rate of 3 degrees Celsius per hour.

a. Write an inequality that represent n , the number of hours past midnight, when the temperature was colder than -5 degrees Celsius. Explain your reasoning.

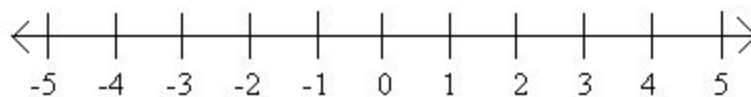
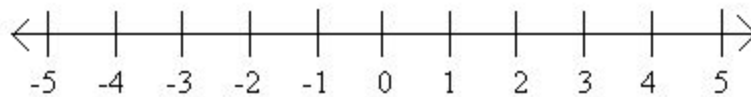
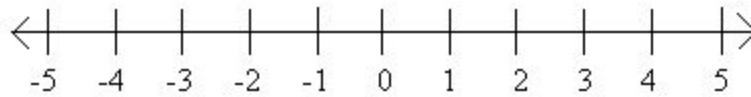
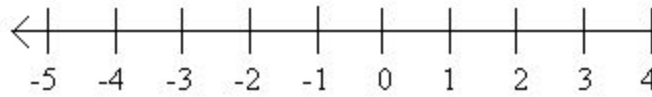
b. On the number line, show all the values of n that make your inequality true.



4. Which number line shows all the values of x that make the inequality $-5x + 3 \geq 18$ true?

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5. Expand to write an equivalent expression: $-\frac{1}{4}(-12x + 20y)$

6. Factor to write an equivalent expression: $81m - 108$

7. Skyler is simplifying the expression $8 - 4x + 7 + 6x$. Here is her work:

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$$8 - 4x + 7 + 6x$$

$$(8 - 4)x + (7 + 6)x$$

$$4x + 13x$$

$$17x$$



a. Skyler's work is incorrect. Explain the error she made.

b. Simplify the expression $8 - 4x + 7 + 6x$.

Solve for each variable (#8-13)

8. $3(x + 6) = 86 + x$

9. $\frac{r}{-5} = -18$

10. $-2.3x - 8.7 = -0.8x - 4.2$

11. $-12 \geq -8 + 6m$

12. $3(5x + 2) - 11x < 38$

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13. $-3.8 \leq g + (-4.7)$

14. A fish tank holds 20 liters of water. Each day the tank drains 0.7 liters of water. A sensor will buzz when the remaining water is 3.5 liters or less.

a. Starting from a full tank, can the fish tank last 15 days without the sensor going off? Explain or show your reasoning.

b. Write and solve an equation to determine the number of days the fish tank can last without the sensor buzzing.

c. Write and solve an inequality that represents this situation. Explain what the solution means in the context of the situation before the buzzer goes off.