

UNIT
3

Expressions, Equations, and Inequalities

Unit Test: C

1. Which equation below matches the relationship shown in the table?

p	0	1	2	5
q	-1.7	-1.4	-1.1	-0.2

- A $q = p - 1.7$
 B $q = 0.3p - 1.7$
 C $q = 2p - 1.7$
 D $q = 0.4p - 1.7$
2. Jill earns a yearly salary of \$40,000 plus 15% commission on total sales. Shonda earns a \$55,000 yearly salary plus 10% commission on total sales. If Jill and Shonda each have sales of \$750,000, how much more total income does Jill earn for the year?
- A \$22,500
 B \$37,500
 C \$130,000
 D \$152,000
3. What is the solution to the inequality below?

$$-3x - 14 \leq -5$$

- A $x \leq -3$ C $x \geq -3$
 B $x \leq 3$ D $x \geq 3$
4. What is the solution to the nearest tenth to the equation below?

$$0.3y = -2$$

- A 0.6 C -6
 B -6.7 D 6.7

5. Which table below represents the same linear relationship as $y = 0.15x - 8$?

A

x	0	2	4
y	-8	-7.7	-6.8

B

x	0	4	8
y	-8	-7.4	-6.8

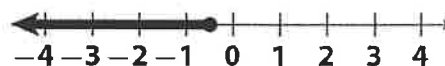
C

x	0	5	8
y	-8	-7.2	-6.8

D

x	0	6	8
y	-8	-7.8	-6.7

6. Which inequality has the graphed solution below?



- A $-2x - 4 \geq -5$ C $2x - 4 \leq -5$
 B $-2x - 4 \geq 5$ D $2x - 4 \leq 5$

7. Antonia currently has \$4,500 in her savings account. She saves \$150 per month. Cal currently has \$3,400 in his account. He saves \$250 per month. How much more money than Antonia will Cal have after 12 months?

- A \$100 C \$6,300
 B \$250 D \$6,400

8. Which of the following values of x is **not** a solution to the inequality $-5x - 1 \leq -9$?

- A 1 C 3
 B 2 D 4

9. How many positive integers are in the solution set of the inequality below?

$$-2x + 1 \geq -6$$

- A one
 B two
 C three
 D infinitely many

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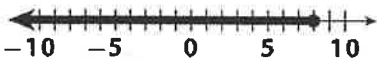
Expressions, Equations, and Inequalities

10. Mike and Joe are both plumbers. Mike charges an initial fee of \$100 plus an hourly fee of \$60. Joe charges an initial fee of \$50 plus an hourly fee of \$75. If Mike and Joe each have 3-hour jobs, who earns more money? How much more?

11. If $4a - 1 = 5$ and $2b - 8 = 17$, what is the value of $a + b$?

12. Draw a number line to represent the inequality $\frac{-x}{4} \leq 1$.

13. Complete the inequality for the number line below.



$\frac{-x}{2} \geq$ _____

14. The perimeter of a rectangle is less than or equal to 50 inches. The length of the rectangle is 10 inches. What inequality represents the possible values of the width of the rectangle?

Use the table for 15–17.

Number of Hours	1	2	3	4
Price (\$)	22.50	29.25	36.00	42.75

A sailboat rental company charges an initial fee plus an hourly rate to rent sailboats. The costs are shown in the table above.

15. What is the initial fee to rent a sailboat?

16. What is the hourly rate to rent a sailboat?

17. Write a linear equation that shows the relationship between the cost and the number of hours of the sailboat rental.

18. Britney paid \$4.50 for two mangoes and one bag of grapes. Finn paid \$9.25 for three mangoes and two bags of grapes. Britney and Finn both paid \$1.25 for each mango. How much more did Finn pay for a bag of grapes?

19. Mr. Jacobs has a \$200 budget for school supplies. He purchased 12 reams of printer paper for \$4 each and six packs of dry-erase markers for \$3 each. He will spend the rest of his budget on calculators, which cost \$8 each. Write and solve an inequality that represents the number of calculators he can purchase.

MODULE
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Expressions and Equations
Module Quiz: B

- Which of the following is the solution to the equation below?

$$x - 1.4 = 0.6$$

A 0.8 C 1.2
 B 1.0 D 2.0
- Lani opened a savings account with \$450. She saves \$225 per month. Which equation shows how much money Lani has in her account after m months?

A $y = -\frac{450}{225}m$
 B $y = 450m + 225m$
 C $y = 450 + 225m$
 D $y = 225 + 450m$
- What is the value of y that satisfies the equation below?

$$\frac{y}{3} = 12$$

A 3 C 36
 B 4 D 63
- Kimmy earns a \$200 commission on all sales plus a base salary of \$30,000. Her total income last year was \$80,000. Which equation can be used to calculate the number of Kimmy's sales?

A $30,000 + 200x = 80,000$
 B $30,000 - 200x = 80,000$
 C $200 + 30,000x = 80,000$
 D $80,000 + 200x = 30,000$
- Rashida owns a bike rental company. She charges an initial fee of \$10 for each rental and an hourly rate of \$4. Which of the equations below shows the amount y that Rashida charges for a bike rental that lasts x hours?

A $y = 10 + 4x$ C $y = 4 + 10x$
 B $y = 10 - 4x$ D $y = 4 - 10x$
- Which of the following uses the Distributive Property?

A $0.4 \times (2a - 0.3b) = 0.4 + (2a - 0.3b)$
 B $0.4 \times (2a - 0.3b) = \frac{(2a - 0.3b)}{0.4}$
 C $0.4 \times (2a - 0.3b) = 0.8a - 0.12b$
 D $0.4 \times (2a - 0.3b) = 0.8a \times 0.12b$
- The chess club has 50 members. They want to raise \$680 for a trip to a competition. The school will give \$130. How much must each member pay?

A \$5 C \$11
 B \$10 D \$550
- Which of the following ratios is **not** equivalent to 1:4?

A $\frac{1}{2}$ C $\frac{3}{12}$
 B $\frac{2}{8}$ D $\frac{4}{16}$
- Which of the following values does **not** satisfy the inequality $-2x - 6 \leq 1$?

A -4 C -2
 B -3 D -1
- Alexa started a race with a 50-meter head start. She ran at a rate of 6.25 meters per second. After how many seconds was Alexa 200 meters past the starting line?

A 20 C 32
 B 24 D 40
- Jamie has 6 quarters and some dimes in his pocket. The total value of the coins is \$4.50. How many dimes does he have in his pocket?

A 10 C 30
 B 20 D 40

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Expressions and Equations

12. Massimo has \$90 in the bank. Every time he rides the bus he spends \$2.50. Write and solve an equation that Massimo can use to see how many times he can ride the bus.

13. Timani bought a video game console and some games for \$350. The video game console cost \$200. Each game cost \$25. How many games did Timani purchase?

14. Allison bought some shirts for her clothing store for \$15 each. She received \$50 off her entire purchase and spent a total of \$400. How many shirts did Allison purchase for her store?

15. Jane has 6 more than half the number of pairs of shoes that Mercedes has. Write an expression for this.

16. Write a word phrase for $0.3x + 5$.

17. Kelly has 4 dimes and some nickels. The total value of her coins is \$2.25. Write an equation for this.

18. Solve for x .

$$0.25x = 10$$

19. Paco solved the equation $-3x - 5 = 1$. His work is shown below.

Step 1: $-3x - 5 = 1$

Step 2: $-3x = 6$

Step 3: $x = 2$

Where did Paco make an error in his calculation? Explain.

20. Oswaldo earns a salary of \$2,500 per month plus an 8% commission on all of his sales. He wants to earn \$5,400 next month. Write an equation that shows what his total sales s must be in order for Oswaldo to reach his goal.

21. Wallace has a \$50 bill. Pizza pies cost \$12.25 each. If p represents the number of pizzas he buys, write an expression for the change he receives.

22. Juma earns \$12.50 for each newspaper subscription he sells. He also earns a \$50 base salary each week. If he wants to earn \$400 next week, how many newspaper subscriptions does he need to sell? Write an equation and solve.

MODULE
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Inequalities
Module Quiz: B

- What is a value of y that satisfies the inequality below?

$$\frac{y}{3} \leq 12$$

A 42	C 38
B 39	D 36
- Which of the following is a solution to the inequality below?

$$2x > 6$$

A -3	C 3
B 2	D 5
- Parvinder wants to save \$500 for a trip. Which inequality shows the least amount she must save each month for 6 months to accomplish this?

A $6x \leq 500$	C $6x \geq 500$
B $6x < 500$	D $x \geq 500 + 6$
- TJ earns a 20% commission on all sales plus a base salary of \$40,000. His total income last year was more than \$70,000. Which inequality can be used to calculate the minimum number of TJ's sales?

A $40,000 + 0.2x \geq 70,000$
B $40,000 - 0.2x \geq 70,000$
C $0.2 + 40,000x \geq 70,000$
D $70,000 + 0.2x \geq 40,000$
- Tony wants to buy a ticket for \$15.75. He has \$9.25. How much must he earn to buy the ticket?

A at least \$6.00
B less than \$6.00
C at least \$6.50
D at least \$7.00
- Peggy wants to run 5 miles in less than 60 minutes. What inequality shows what her rate should be?

A 1 mi < 60 min	C 1 mi < 12 min
B 3 mi < 60 min	D 2 mi < 30 min
- There are 125 members in the school marching band. The band wants to raise \$25,000 for a trip to a national competition. The school agreed to contribute \$5,000 towards the trip. Which inequality shows the amount of money that each band member should raise?

A $125x + 25,000 \geq 5,000$
B $125x + 5,000 \geq 25,000$
C $5,000x + 125 \geq 25,000$
D $5,000x + 25,000 \geq 125$
- Which of the following is the solution to the inequality $-2x - 4 \leq 11$?

A $x \leq -\frac{15}{2}$	C $x \geq -\frac{15}{2}$
B $x \leq -\frac{7}{2}$	D $x \geq -\frac{7}{2}$
- Which of the following ratios is **not** equivalent to 2:10?

A $\frac{1}{5}$	C $\frac{4}{20}$
B $\frac{2}{5}$	D $\frac{6}{30}$
- Which of the following values does **not** satisfy the inequality $-2x - 6 \leq 1$?

A -4	C -2
B -3	D -1
- Michele needs 30 ounces of pecans to bake some pies. Pecans are sold in 4-ounce packages. Which inequality could be used to find the least number of packages of pecans she has to buy?

A $\frac{30}{x} \leq 4$
B $\frac{4}{x} \leq 30$
C $4x \geq 30$
D $x \leq 30 - 4$

MODULE
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Inequalities

12. Solve the inequality. Show your work.

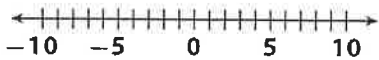
$$\frac{x}{6} \leq 1$$

Use the inequality for 13 and 14.

$$x + 8 \geq 5$$

13. Solve the inequality. Show your work.

14. Graph the solution on the number line.



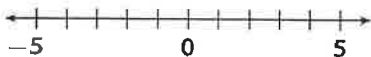
Use the inequalities for 15–17.

$$-3x > 9$$

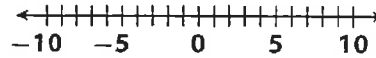
$$3x > -9$$

15. Explain the difference between the two inequalities. How does this affect your method of solution?

16. Solve the first inequality and graph its solution on the number line.



17. Solve the second inequality and graph its solution on the number line.



18. Raja solved the inequality $-3x - 5 \leq 1$. His work is shown below.

Step 1: $-3x - 5 \leq 1$

Step 2: $-3x \leq 6$

Step 3: $x \leq -2$

Where did Raja make an error in his calculation? Explain.

19. Joaquim earns a salary of \$4,000 per month plus a 6% commission on all of his sales. He wants to earn at least \$7,000 next month. Write an inequality that shows what his total sales s must be in order for Joaquim to reach his goal.

20. Every month, the bank withdraws \$15 from Betsy's checking account as a service fee. Betsy has budgeted \$75 for the next few service fees. For how many months will the service fee be covered? Write and solve an inequality to find the solution. Show your work.

