Math Unit 8 Dugger Exponents and Scientific Notation

1. Simplify $5^{-2} \times 5^5 \times 5$. Write in exponent notation.

2. What is the value of the expression $\dfrac{2^{-6}}{2^4} \times 2^8$?

3. Simplify the expression in exponent form to $(4^4)^3 \times 4 \times 3^0$?

4. The volume of a cube is 125 cubic centimeters. How many centimeters long is each edge of the cube?

5. What is the standard form of 3.2×10^{-3}?

6. The speed of light is about 3.0×10^8 meters per second. The speed of sound at sea level is about 3.0×10^2 meters per second. **About** how many times faster is the speed of light than sound?

7. The population of the town of Fair Bluff is approximately 9.8×10^4. The population of Tabor City is approximately 2.5×10^4. **About** how many times larger is Fair Bluff than Tabor City?

8. Chemists define a mole of a compound as 6×10^{23} molecules of that compound. How many moles are in 3×10^{24} molecules?

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9. Which value is equivalent to $2.4 \times 10^4 - 1.7 \times 10^2$?

10. Tyler's math class found that it would take 2.5×10^8 dollar bills to cover a square mile area. The surface area of the United States is about 3.8×10^6 square miles. About how many dollar bills are needed to cover the United States?

11. Donna and Joe are both saving money. The equation $y = 53x$ gives the amount of money Donna has saved after x weeks. The table below gives the amount of money Joe has saved over a few weeks.
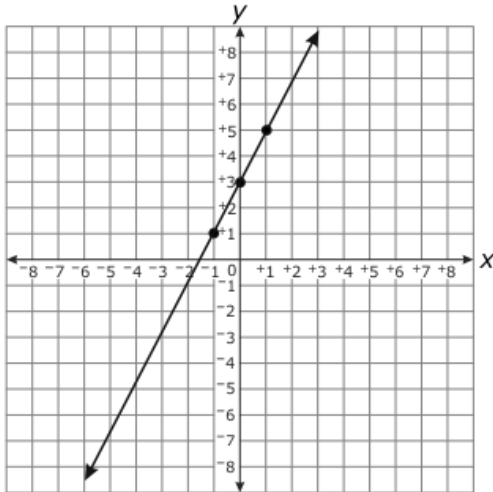
Number of Weeks	Amount Saved
3	$141
7	$329
11	$517

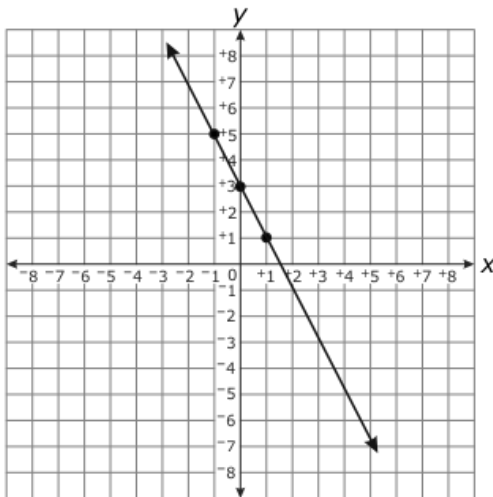After 21 weeks who has saved the most money and how much more?
A. Joe has saved $6 more than Donna.
B. Donna has saved $6 more than Joe.
C. Joe has saved $126 more than Donna.
D. Donna has saved $126 more than Joe.
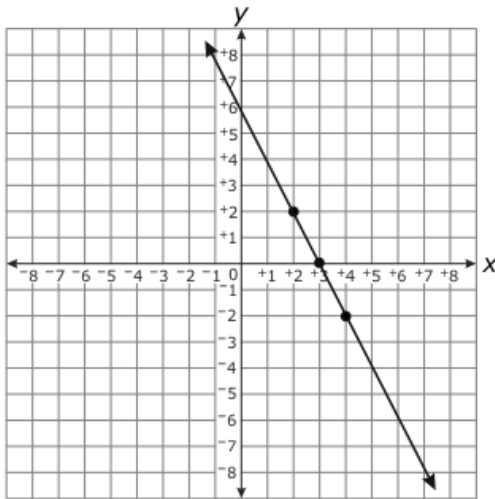
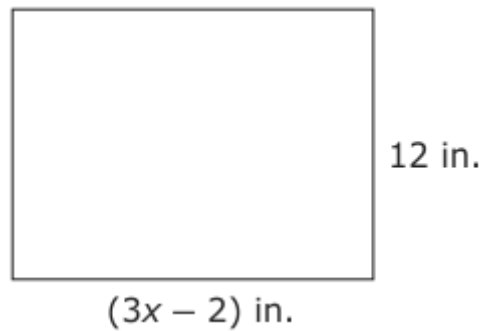**12.** Which shows the graph of the equation $y = {}^-2x + 3$?

A.

B.

C.

13. The perimeter of the rectangle below is 56 in. Find x.

12 in.

$(3x - 2)$ in.

14. The set of ordered pairs $\{(5, 3), (\text{-}2, 1), (0, 3), (x, 6)\}$ is a function. Which is a possible value for x?

A. 0

B. 3

C. 5

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15. Kevin is looking at bicycle rental companies to use while he is on vacation. Company 1 charges $4.50 per hour, plus a one-time fee of $9. The table below shows the total cost to rent a bicycle for different amounts of time from Company 2.

Company 2

Number of Hours (x)	Total Cost (y)
2	$18.00
4	$29.00
6	$40.00

Which statement is true?

A. Company 1 charges $1 less per hour than Company 2.
B. Company 1 charges $1 more per hour than Company 2.
C. Company 1 charges $2 less per hour than Company 2.
D. Company 1 charges $2 more per hour than Company 2.

16. **Which equation represents a nonlinear function?**

A. $y = \frac{1}{2}x - 5$

B. $2y = \frac{1}{2}x + 5$

C. $3y = \frac{1}{2}x + 5$

D. $4y = \left(\frac{1}{2}\right)^x - 5$

17. **Which table contains coordinates that all satisfy the equation** $y = -2x + 3?$

A.

x	y
0	3
-2	-1
1	1
4	-5

B.

| x	y
-1	5
1	1
3	-3
5	-7

C.

x	y
-3	9
-2	7
2	-1
4	5

18. For a special event, a restaurant charges a one-time setup fee, plus a charge for each person attending the event. The charge for 5 people is $100. The charge for 10 people is $162.50. How much is the one-time setup fee for an event?
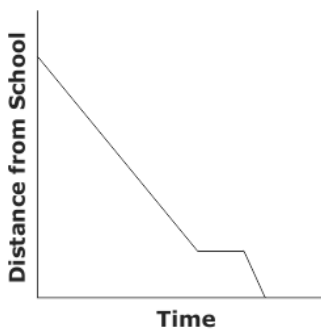
    A. $12.50

    B. $16.25

    C. $20.00

    D. $37.50

19. Roberto was walking home after school. He stopped half way between his home and school to visit his friend who was sick. He then left his friend and walked the rest of the way home. Which graph represents Roberto's walk home?
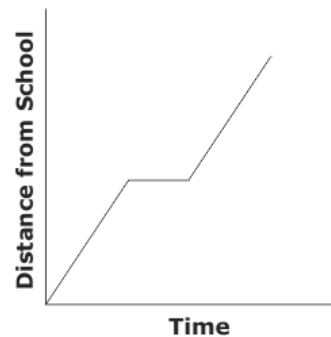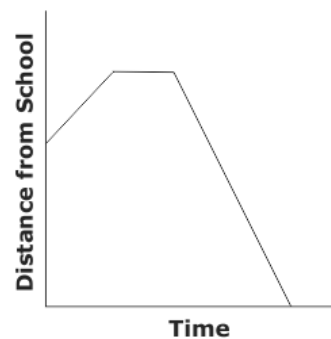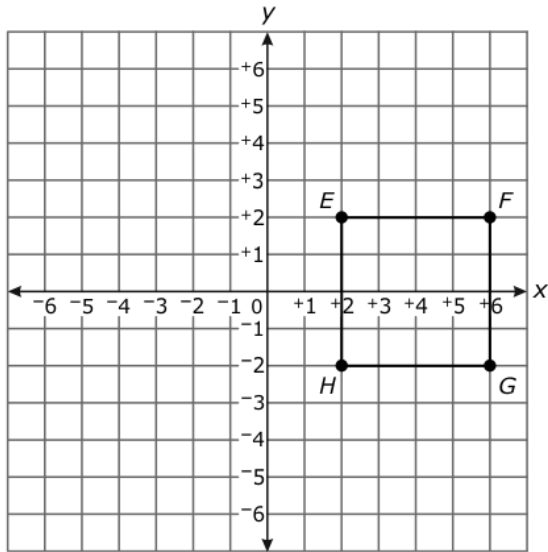
A.
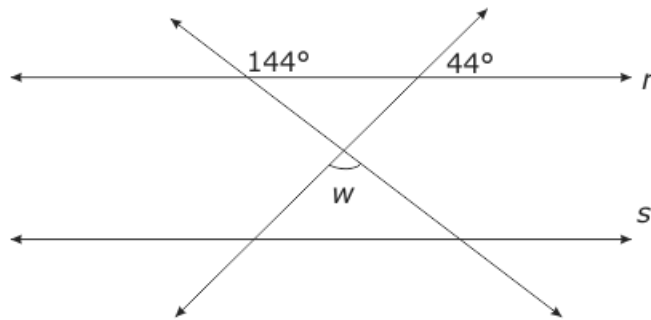
B.

C.

D.

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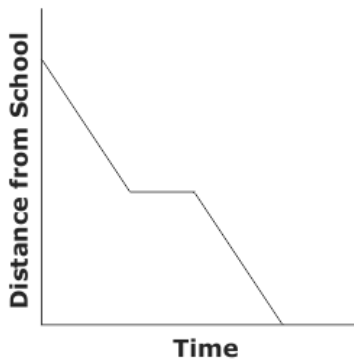
20.

Square *EFGH* will be dilated by a scale factor of $\frac{1}{2}$. What is the coordinate of G'?

21. In the figure below, lines *r* and *s* are parallel. Find the measure of <w?

22. Sarah left the boat dock and sailed 5 miles due east. She turned and then sailed 10 miles due north. **About** how far is Sarah from the boat dock?

23. Mary drove from her home to the library. After she left the library, she drove to the park. After that, she drove home. The map shows the path she took. How far did Mary drive?

MARY'S TRIP

Library (-4, 9)

Home (-4, 1)

Park (2, 1)

KEY

⊢ = 1 mile
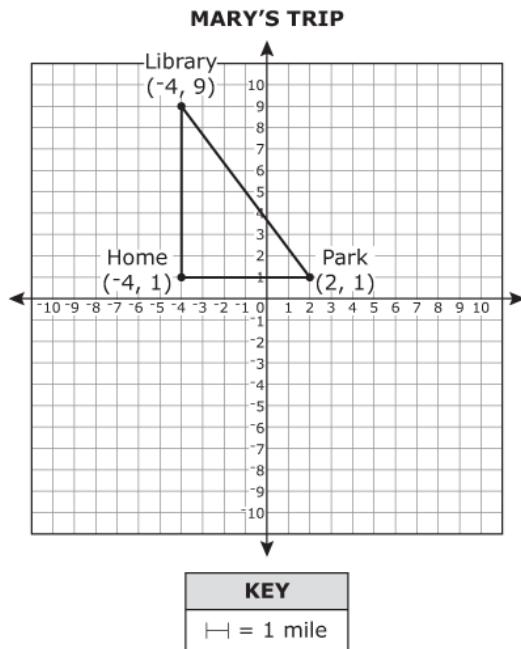
24. Write a fraction that is equivalent to $0.\overline{54}$?

25. What is the **approximate** value of $\sqrt{10} + \sqrt{34}$?