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148% is equivalent to what fraction?

a. $\frac{148}{1}$

b. $\frac{37}{25}$

c. $\frac{50}{74}$

d. $\frac{1}{148}$

Answer: B

Explanation:

This problem focuses on equivalent fractions and percentages. A percentage is a part out of 100, so 148% is equivalent to $\frac{148}{100}$. This fraction can be simplified by dividing the numerator and denominator by the greatest common factor. $\frac{148}{100} = \frac{148 \div 4}{100 \div 4} = \frac{37}{25}$.

The cost of tickets to a community event is shown in the table below. Which of the following is the unit rate?

Number of tickets	5	10	20	30
Cost ($)	30	60	120	180

a. $\frac{6}{1}$

b. $\frac{1}{6}$

c. $\frac{5}{1}$

d. $\frac{1}{5}$

Answer: A

Explanation:

The unit rate is determined by the ratio $\frac{Cost(\$)}{Number\ of\ tickets}$. Using the data from the first column from the table, the unit rate is $\frac{30}{5}$ or $\frac{6}{1}$. Therefore, choice A is correct.

Enrique used a formula to find the total cost, in dollars, for repairs he and his helper, Jenny, made to a furnace. The expression below shows the formula he used, with 4 being the number of hours he worked on the furnace and 2 being the number of hours Jenny worked on the furnace.

$$20 + 35(4 + 2) + 47$$

What is the total cost for repairing the furnace?

a. $189
b. $269
c. $277
d. $377

Answer: C

Explanation:

To solve this formula, follow the order of operations. First, add what is in the parenthesis, 4 + 2, to get 6. Then, multiply the 6 by 35 to get 210. Last, we should add 20 + 210 + 47 to get 277.

Question: 4

Triangle A has side lengths of 12 cm, 8 cm, and 16 cm. Triangle B is related to Triangle A by a scale factor of $\frac{1}{4}$. Which of the following represents the dimensions of Triangle B?

a. 4 cm, 2 cm, 8 cm
b. 2 cm, 3 cm, 8 cm
c. 3 cm, 2 cm, 4 cm
d. 6 cm, 4 cm, 8 cm

Answer: C

Explanation:

Since the lengths of Triangle B are related to the lengths of Triangle A by a scale factor of $\frac{1}{4}$, each side length of Triangle A should be multiplied by the factor $\frac{1}{4}$: $12 \times \frac{1}{4} = 3$; $8 \times \frac{1}{4} = 2$; $16 \times \frac{1}{4} = 4$. The side lengths of Triangle B measure 3 cm, 2 cm, and 4 cm, respectively.

Question: 5

Sha is packaging cupcakes in packs of 12. Which expression does NOT express the relationship between packages, p, and cupcakes, c?

a. $12c = p$
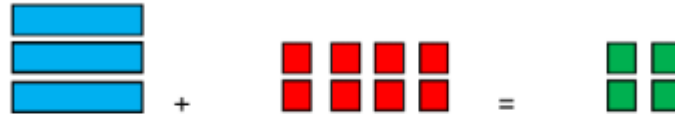b. $p = \frac{c}{12}$
c. $c = 12p$
d. $\frac{c}{p} = 12$

Answer: A

Explanation:

If each package holds 12 cupcakes, the relationship between packages and cupcakes is that the number of cupcakes is 12 times the number of packages. This can be expressed by many equivalent equations: $c = 12p$, $p = \frac{c}{12}$, "and" $\frac{c}{p} = 12$. $12c = p$ would express the reverse relationship, that the number of packages is 12 times the number of cupcakes.

Question: 6

Elaine represents an equation using the algebra tiles shown below

Given that ☐ represents x, 🟩 represents positive 1, and 🟥 represents negative 1, which of the following represents the solution to the equation?

    a. $x = -6$
    b. $x = 4$
    c. $x = 12$
    d. $x = -4$

Answer: B

Explanation:

The equation represented by the algebra tiles is $3x - 8 = 4$. Solving for x gives $3x = 12$, so $x = 4$. The equation can be visually solved by adding 8 green tiles to each side, and using the additive inverse property to isolate the $3x$. The equation can then be written as $3x = 12$. Each x can be mapped to 4 positive integer tiles. Thus, $x = 4$.

Question: 7

Petra installed 10 light fixtures at a new warehouse that was being built. Each of the fixtures required 3 light bulbs. The bulbs come in packages of 5 and cost $8 per package. What was the total cost for the bulbs required for all of the fixtures Petra installed at the warehouse?

    a. $16
    b. $48
    c. $120
    d. $240

Answer: B

Explanation:

To answer this question, find the total number of bulbs required by multiplying 10 by 3. The number of packages of bulbs required can be found by dividing this total number of bulbs, 30, by 5, to find that 6 packages are needed. Then, multiplying 6 by the cost per package, 8, we find that the total cost for all the bulbs needed was $48.

Question: 8

A unit of liquid measure in the English System of Measure is the gill. The table, shown here, gives conversions from gills to fluid ounces.

Conversion Table

Gills	Fluid Ounces
2	8
4	16
5	20
6	24
10	40

Which equation best describes the relationship between gills, g, and fluid ounces, f?

a. $f = 8g - 8$
b. $f = 2g + 4$
c. $f = 4g$
d. $4f = g$

Answer: C

Explanation:

Looking at the chart, a pattern can be seen in the relationship between the number of gills and the number of fluid ounces. Each number of gills in the first column, when multiplied by 4, gives the number of fluid ounces in the second column. So, f equals 4 times g, or $f = 4g$.

Question: 9

Two rectangles are similar. The length and the width of the first rectangle is 3 meters by 6 meters. The second rectangle is similar by a scale factor of $\frac{1}{2}$. What are length and width of the second rectangle?

a. 1.5 meters by 3 meters
b. 3.5 meters by 6.5 meters
c. 6 meters by 12 meters
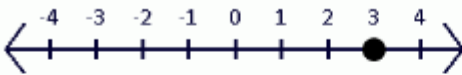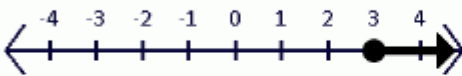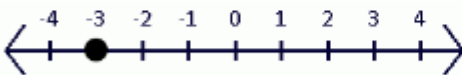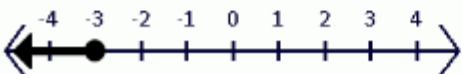d. 1 meter by 2.5 meters

Answer: A

Explanation:

Since the scale factor is less than 1, the second rectangle is smaller than the first rectangle. To find the dimensions of the second rectangle, multiply each dimension of the first rectangle by $\frac{1}{2}$ or 0.5. Since (0.5)(3) is 1.5, and (0.5)(6) is 3, the dimensions of the second rectangle are 1.5 meters by 3 meters. Therefore, choice A is correct.

Question: 10

Which of the following is the correct representation for the solution of $x + 2 = 5$?

a.

b.

c.

d.

Answer: A

Explanation:

The equation $x + 2 = 5$ can be solved by subtracting 2 from both sides of the equation. This results in $x = 3$. This is represented by a solid circle at 3 on a number line. Therefore, choice A is correct.

Question: 11

Tommy is 4 years older than Gianna. Which equation represents the relationship between Tommy's age, t, and Gianna's age, g?

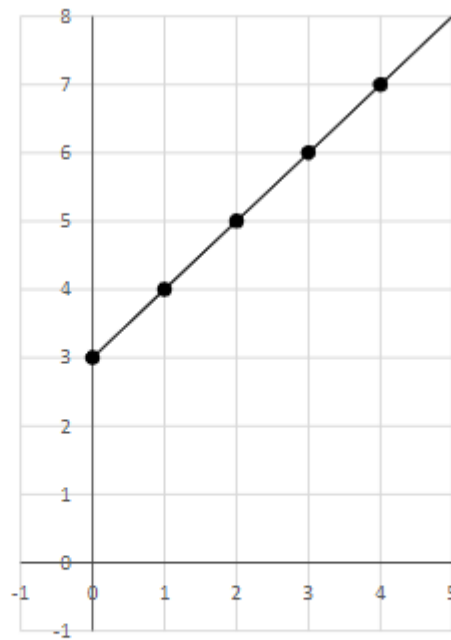a. $4 + t = g$
b. $t = 4 + g$
c. $4 - t = g$
d. $g - t = 4$

Answer: B

Explanation:

Tommy's age is 4 more than Gianna's age. For example, if Tommy is 13 years old, Gianna is 9 years old. Tommy's age, t, is Gianna's age, g, plus 4. The equation $t + 4 = g$ is the only equation listed that represents the relationship in the story.

Question: 12

Charlie wrote a story to match the graph below.

Which story below could be the story that Charlie wrote?

a. Damien is 3 years older than Jackson.
b. Damien sold 3 times as many candy bars as Jackson.
c. Damien didn't make any money for 3 weeks and then made 1 dollar each week.
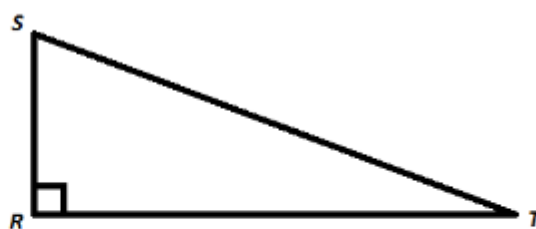d. Damien read 3 pages each day for 4 days.

Answer: A

Explanation:

This problem focuses on writing situations to match a graph. There are many strategies that can be used to solve this problem. One strategy is to identify an equation to match the graph and then match the story to the equation. The graph includes the points $(0,3)$, $(1,4)$, $(2,5)$, $(3,6)$, and $(4,7)$ where each y value is 3 more than each x value. The equation that matches the graph is $y = x + 3$. The story that represents the relationship is option A, where Damien is 3 years older than Jackson.

Question: 13

In **ΔRST**, shown here, m∠S is 20° less than m∠R.
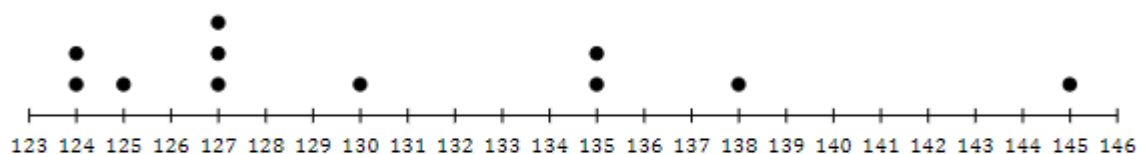

What is the measure of ∠T?
    a. 110°
    b. 70°
    c. 50°
    d. 20°

Answer: D

Explanation:

The box symbol shown at ∠R means that ∠R measures 90°. Since we are told m∠S is 20° less than m∠R, subtract 90 –20 to get 70. This means that m∠S = 70°. The sum of m∠R and m∠S is found by adding: 90 +70 = 160. The sum of all angles in a triangle always adds up to 180°, so subtracting 180 – 160 results in a difference of 20. So, m∠T is 20°.

Question: 14

The dot plot shows the number of sandwiches sold each day by a sandwich shop.

123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146

Which statement is best supported by the data?
    a. The sandwich shop sold 135 sandwiches more often than they sold 124 sandwiches.
    b. The sandwich shop sold more than 129 sandwiches on 5 days.
    c. The sandwich shop sold sandwiches for only 10 days.
    d. The sandwich shop sold fewer than 130 sandwiches exactly half of the time.

Answer: B

Explanation:

This problem focuses on interpreting data from a dot plot. Based on the data, the sandwich shop sold 135 sandwiches on two days and sold 124 sandwiches on two days, so the first statement is not supported by the data. The sandwich shop sold more than 129 sandwiches on 5 days, so the second statement is supported by the data. The sandwich shop sold sandwiches for 11 days, so the third statement is not supported by the data. The sandwich shop sold fewer than 130 sandwiches $\frac{6}{11}$ of the times, so the fourth statement is not supported by the data.

Question: 15

Kimi is saving to buy a pair of earbuds that cost $195. She makes money mowing lawns and earns $10 for each lawn she mows. Which inequality illustrates how many lawns, x, Kimi needs to mow to make at least $195?

a. $195 < 10x$
b. $195 > 10x$
c. $195 \leq 10x$
d. $195 \geq 10x$

Answer: C

Explanation:

If Kimi makes $10 for each lawn, where x is the number of lawns, then the expression $10x$ describes the number of dollars Kimi makes. If the earbuds Kimi wants cost $195, she needs at least $195 to buy the earbuds. If Kimi needs at least $195, that means that she can make more than $195 to get the earbuds but cannot make less than $195. This means that the number of dollars made, $10x$, must be more than or equal to $195. The expression that represents this is $10x \geq 195$, or $195 \leq 10x$.