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Tutor Doctor

Math 7: Patterning and Algebra, 10 Questions

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1. If Chris (c) is 15 years old and his Dad is $2c + 14$ years old, how old is Chris' dad?

- A) 15 years
- B) 26 years
- C) 29 years
- D) 44 years

Incorrect. Your answer=A, Correct answer=D

Explanation:

$$2c + 14$$

$$= 2(15) + 14$$

$$= 30 + 14$$

$$= 44 \text{ years old}$$

2. The sum of two numbers is 30. One number is 5 times larger than the other. What are the two numbers?

- A) 5 and 25
- B) 10 and 20
- C) 6 and 24
- D) 5 and 6

Correct. Your answer=A, Correct answer=A

Explanation:

Let x be one of the numbers. Then the other number is $5x$. Since their sum is 30, we can write:

$$x + 5x = 30$$

$$6x = 30$$

$$x = 5$$

Therefore, the first number is 5 and the second number is $5 \times 5 = 25$. Therefore, the correct response is A).

3.

Lee is renovating his bathroom and re-tiling the shower wall. The diagram below shows the pattern that Lee has selected:



If Lee is unable to buy as many red tiles as he needs to create the pattern he has selected, he has created some other pattern options. If Lee wants to keep the new pattern the same length as the original repeating pattern shown above, which pattern below would **not** work?



- A) Grey – Red – Grey – Blue – Grey – Red – Grey
- B) Yellow – Blue – Yellow
- C) Orange – Blue – Orange
- D) Grey – Grey – Grey – Grey – Blue – Grey – Grey – Grey – Grey

Incorrect. Your answer=A, Correct answer=B

Explanation:

To begin, determine the length of Lee's original pattern:

Red – Red – Blue – Red – Red

$$10 + 10 + 2.25 + 10 + 10 = 42.25 \text{ cm}$$

Next, determine the length of each pattern indicated in the answers to determine which patterns equal 42.25 cm.

A) Grey – Red – Grey – Blue – Grey – Red – Grey

$$5 + 10 + 5 + 2.25 + 5 + 10 + 5 = 42.25 \text{ cm}$$

B) Yellow – Blue – Yellow

$$21.12 + 2.25 + 21.12 = 44.49 \text{ cm}$$

C) Orange – Blue – Orange

$$20 + 2.25 + 20 = 42.25 \text{ cm}$$

D) Grey – Grey – Grey – Grey – Blue – Grey – Grey – Grey – Grey

$$5 + 5 + 5 + 5 + 2.25 + 5 + 5 + 5 + 5 = 42.25 \text{ cm}$$

This allows you to see that, with the exception of pattern B, all patterns would work.

4. An expression which shows how many minutes it takes Marianne to do her homework is:

$$3m + 5s = \text{time to do her homework}$$

where m = number of pages of math homework to do

where s = number of pages of science homework to do

If Marianne has 4 pages of math homework and 6 pages of science homework, how long will it take her to finish all her homework tonight?

A) 18 minutes

B) 38 minutes

C) 42 minutes

D) 42 hours

Incorrect. Your answer=A, Correct answer=C

Explanation:

$$3m + 5s$$

$$= 3(4) + 5(6)$$

$$= 12 + 30$$

$$= 42 \text{ minutes}$$

5. Michael writes an equation which relates his current age (m) to that of his Uncle Tim (t). The equation Michael wrote is $t = 2m + 5$. In words, the relationship between Michael's age and his Uncle Tim's age is:

A) Michael is five years less than twice Uncle Tim's age

B) Uncle Tim is five years less than twice Michael's age

C) Michael is five years more than twice Uncle Tim's age

D) Uncle Tim is 5 years more than twice Michael's age

Incorrect. Your answer=A, Correct answer=D

Explanation: Convert each answer into a number equation.

A) $m = 2t - 5$

B) $t = 2m - 5$

C) $m = 2t + 5$

D) $t = 2m + 5$

Therefore, the correct answer is D.

6. $x = 5$ is the solution for which equation below?

A) $x + 10 = 15$

B) $10 - x = 15$

- C) $x - 7 = 2$
 D) $42 = 37 - x$

Correct. Your answer=A, Correct answer=A

Explanation:

- Choice A $x + 10 = 15 \longrightarrow 5 + 10 = 15$ TRUE
 Choice B $10 - x = 15 \longrightarrow 10 - 5 \neq 15$ FALSE
 Choice C $x - 7 = 2 \longrightarrow 5 - 7 \neq 2$ FALSE
 Choice D $42 = 37 - x \longrightarrow 42 \neq 37 - 5$ FALSE

7. A can of pop weighs 355 g and a sandwich weighs 125 g. What is the total mass of the items in Ethan's lunch bag if he fills it with 2 cans of pop and 4 sandwiches?

- A) 1210 g
 B) 210 g
 C) 480 g
 D) 1670 g

Correct. Your answer=A, Correct answer=A

Explanation:

Express as an equation and solve.

Let p represent the weight of a can of pop = 355 g
 Let s represent the weight of a sandwich = 125 g

$$\begin{aligned} & 2p + 4s \\ &= 2(355 \text{ g}) + 4(125 \text{ g}) \\ &= 710 \text{ g} + 500 \text{ g} \\ &= 1210 \text{ g} \end{aligned}$$

8. The value of the expression $4d - 2$ for $d = 5$ is

- A) 20
 B) 18
 C) 16
 D) 14

Incorrect. Your answer=A, Correct answer=B

Explanation:

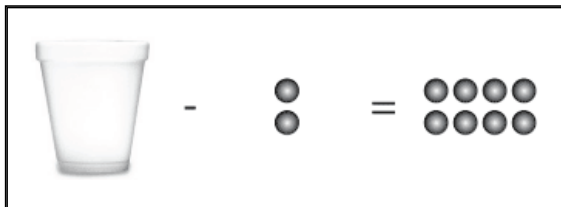
$4d - 2$ replace d with 5

$4(5) - 2$ multiply

$20 - 2$ subtract

18

- 9.



How many counters must be in the cup to make the equation true?

- A) 6
 B) 8
 C) 10
 D) 12

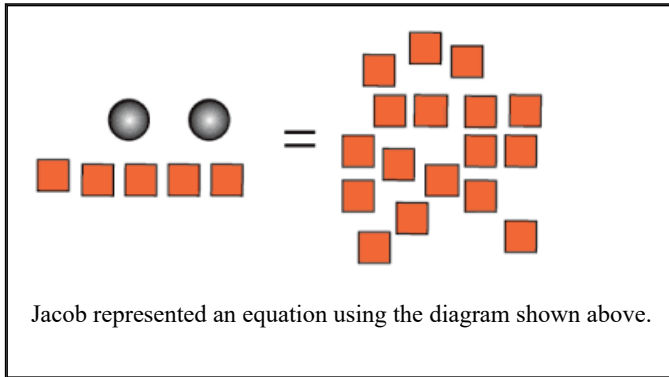
Incorrect. Your answer=A, Correct answer=C

Explanation:

The equation being modeled could be written as:
 $C - 2 = 8$

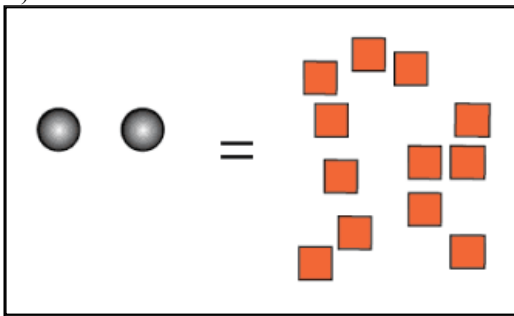
Adding 2 to both sides of the equation reveals that:
 $C = 10$

10.

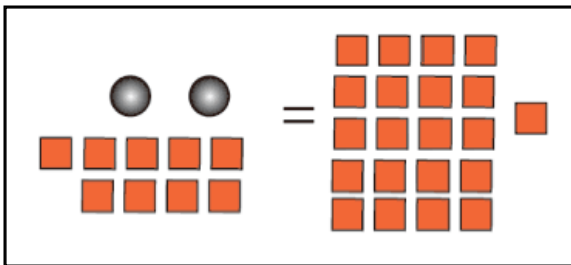


Which of the diagrams below is equivalent to Jacob's original equation?

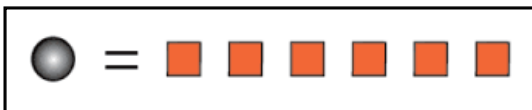
A)



B)



C)



D) All of the above

Incorrect. Your answer=A, Correct answer=D

Explanation:

When working with equations, a very important idea is to preserve equality. So, what we do to one side, we need to do to the other.

Starting from Jacob's ORIGINAL equation, choice A is true; we've just removed 4 red blocks from both sides of the equation.

Starting from Jacob's ORIGINAL equation, choice B is also true; we've simply added 4 red blocks to both sides of the equation (and tidied things up a bit).

Starting from choice A, and comparing both sides, if we separate the red squares into two equal groups, each "circle" then has the same value as 6 red squares.

So all of the diagrams are equivalent.

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