

# Math Challenge 12

## Bikes etc.

Use the following information to answer problems in this challenge.



**Helmet \$50**  
**Biking gloves \$20**  
**Front light \$25**  
**Rear saddlebag \$30**

Assume there is no sales tax.

1. Anna needs a new helmet, biking gloves and a front light. How much will it cost her to buy them?  $\$50 + \$20 + \$25 = \$95$

**Answer: \$95**

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2. What are the two items that add up to be \$55?  
*Guess and check for the two items that may add up to \$55.*

**Answer: A front light and a rear saddlebag**

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3. Dana bought three things that cost her exactly \$105. What did she buy?  
*A helmet, a front light, and a rear saddlebag:  $\$50 + \$25 + \$30 = \$105$ .*

**Answer: a helmet, a front light and a rear saddlebag**

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4. Ian has \$50 and wants to buy two things. What are two different items he can buy?  
*List possible two items that cost \$50 or less.*

**Answer:**  
 biking gloves and a rear saddlebag or biking gloves and front light

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5. Mrs. Jay wants to buy new helmets and biking gloves for 3 of her kids. How much money does she need?  
*3 helmets and 3 biking gloves:  $(3 \times \$50) + (3 \times \$20) = \$150 + \$60 = \$210$*

**Answer: \$210**

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6. Once a year, the store has a special extravaganza sale. Each of the above items is half-off. If Mrs. Jay waits for the Extravaganza Sale to buy the helmets and biking gloves, how much money will she **save**?  
*50% of \$210 = \$105*



**Answer: \$105**

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7. Uncle Bob wants to get three of each item for his three nephews. He plans to shop during the special extravaganza sale. How much will he have to pay, assuming there is no tax?  
*All 4 items: \$125.  
 All 4 items for his 3 nephews:  $3 \times \$125 = \$375$ . Extravaganza sale:  $50\% \times 375 = \$187.50$*

**Answer: \$187.50**

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8. May wants to get all four items during the special extravaganza sale. Her sister, Kay, wants to get a new helmet and a pair of biking gloves. Her brother, Ray, just needs a new helmet. How much will all those items cost assuming there's no tax?  
*May:  $(\$50 + \$20 + \$25 + \$30) \div 2 = \$125 \div 2 = \$62.50$  or  $\frac{1}{2}$  of \$125 = \$62.50; Kay:  $(\$50 + \$20) \div 2 = \$35$ ;  
 Ray:  $\$50 \div 2 = \$25$ ; Total:  $\$62.50 + \$35 + \$25 = \$122.50$*

**Answer: \$122.50**

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9. In total, Adam and Pete have \$28.10. Pete has \$4.90 more than Adam. Which item(s) can Adam buy at the Extravaganza Sale?

Pete:   \$4.90

Adam:

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\$28.10

*Adam:  $(\$28.10 - \$4.90) \div 2 = \$11.60$   
 At the sale, Adam can buy biking gloves for \$10.*

**Answer: biking gloves**

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10. Sitara saved some money. After buying a helmet and a front light at full price, she had  $\frac{2}{5}$  of her money left. How much money did she have at first?

$\frac{3}{5}$  of her money is equivalent to \$75. She must have \$125 at first.

**Answer:** \$125

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11. To be sure that he can afford the special bike, Luke has been saving a big chunk of his allowance for a year. Every week he received \$20 of allowance and spent only  $\frac{1}{5}$  of it. How much money did he save in a year?

There are 52 weeks in a year.  $52 \times (\$20 \times \frac{4}{5}) = \$832$ .

**Answer:** \$832

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12. Amber, Ike, and Tiffany shopped for bicycle accessories at the store's Spring sale. Deals were not as good as the once a year extravaganza sale. Nevertheless, they saved a pretty good amount of money because they did not have to pay full prices.

**Sale price on Helmet, Biking gloves, Front light, and rear saddlebag**

20% off original price of items that cost \$30 or more  
10% off original price of items that cost less than \$30

**Answer:**

**Amber:** Helmet

**Ike:** Biking gloves and front lights

**Tiffany:** Front light and rear saddlebag

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- Amber spent \$0.50 less on her one item than Ike spent on his two items combined.
- For her two purchases, Tiffany got \$3.50 back from \$50.00.
- One of Tiffany's and Ike's purchases was the same item.

What did each person buy?

13. How much did each person spend?

*For Problem 9 and 10: Find the sale price of each item first.*

Item	Original Price	Percent Discount	Discount Amount	Sale Price
Helmet	\$50.00	20%	\$10.00	\$40.00
Biking gloves	\$20.00	10%	\$2.00	\$18.00
Front lights	\$25.00	10%	\$2.50	\$22.50
Rear saddlebag	\$30.00	20%	\$6.00	\$24.00

**Then, Guess and Check**

Amber's one item cost about the same amount as the two items that Ike bought. Amber probably bought *the most expensive item—the helmet*, for \$40.00.

If Amber bought the helmet and Ike spent \$0.50 more than she did, Ike's two items must have cost \$40.50.

One of Ike's items must have been the front light, since the lights are the only item whose price includes \$0.50.

To find the other item Ike bought, subtract the cost of the light, \$22.50, from the total amount he spent, \$40.50.  $\$40.50 - \$22.50 = \$18.00$

Ike's second item must have been biking gloves.

Since Tiffany got \$3.50 back from \$50.00, her two items cost a total of \$46.50. She must have bought the front light, since they are the only item in which the price includes \$0.50.

To find the other item Tiffany bought, subtract the cost of the light, \$22.50, from the total amount that she spent, \$46.50.  $\$46.50 - \$22.50 = \$24.00$

Tiffany's second item must have been a rear saddlebag.

**Find the cost of each purchase.**

Name	Items and Cost of Each	Total
Amber	Helmet for \$40	\$40.00
Ike	Biking gloves for \$18.00; Front lights for \$22.50	\$40.50
Tiffany	Front light for \$22.50; Rear saddlebag for \$24.00	\$46.50

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**Answer:**

**Amber:** \$40.00

**Ike:** \$40.50

**Tiffany:** \$46.50

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14. Luke has been wanting to get a new bike. He did his research and had his heart set on this special bike that costs \$1175. The Extravaganza sale is not applicable to bike prices. Luckily he has two coupons. One is a \$300 off coupon and the other is a 25% off coupon on one item. The store does not allow customers to combine coupons, so he has to choose one coupon to use. Which coupon will give him the most savings?

**Answer: \$300 off**

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With \$300 coupon, the bike costs:  $\$1175 - \$300 = \$875$ .

With the 25% coupon, the bike costs:  $75\% \times 1175 = \$881.25$ . He should use the \$300 off coupon.

15. The discount on the rear saddlebag was increased from 20% to 50%. Find the percent increase in the discount.

**Answer: 150%**

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From 20% to 50%, there is an increase of 30%.

$$\frac{30}{20} \times 100\% = 150\%$$

**Math Challenge 13** will be available online April 8, 2016 at [www.mathinaction.org](http://www.mathinaction.org).