

2025 August AMC 8 Week 1&2

2025 August AMC 8 Week 1 Day 1 - Percents

- 1 An item is marked at **220** dollars. It is sold at a **50%** discount off the marked price, and still yields a profit of **10%**. What is the cost price of this item, in dollars?

A. 200 B. 150 C. 120 D. 100 E. 80

Answer D

Solution $220 \times \frac{5}{10} = 110$ dollars
 $110 \div (1 + 10\%) = 100$ dollars.

- 2 A restaurant has an average monthly revenue of **200,000** dollars. According to regulations, the restaurant must pay a business tax of **5%** of its revenue, and also pay an urban construction fee equal to **7%** of the business tax.

What is the total amount of business tax and urban construction fee the restaurant should pay in one year?

A. 108,400 dollars B. 128,400 dollars
C. 157,400 dollars D. 176,400 dollars
E. 288,000 dollars

Answer B

Solution Business tax: $20 \times 12 \times 5\% = 12$ (ten thousand dollars)

Urban construction fee: $12 \times 7\% = 0.84$ (ten thousand dollars)

Therefore, the total amount of business tax and urban construction fee the restaurant should pay in one year is: $12 + 0.84 = 12.84$ (ten thousand dollars)

3

To mortgage my car, I paid half of its price in the first month, then paid $\frac{1}{10}$ of its original price in the second month. I still owe the car company **10,000** dollars. The price of my car is _____.

- A. 10,000 dollars
- B. 15,000 dollars
- C. 20,000 dollars
- D. 25,000 dollars
- E. 30,000 dollars

Answer D

Solution The total paid in the first two months is: $50\% + 10\% = 60\%$

The remaining unpaid amount is: **40%**.

Since this remaining 40% corresponds to 10,000 dollars, the full price of the car is:

$$\frac{10,000}{40\%} = 25,000 \text{ dollars}$$

4

A certain product is originally sold at its regular price, with a profit of **20%** of the cost per unit. Later, it is sold at **90%** of the original price, and the total profit increases by **20%** compared to before. What is the multiple of the new sales volume compared to the original sales volume?

- A. 2 B. 2.5 C. 3 D. 3.5 E. 4

Answer C

Solution Assume the cost price is 100 dollars. If the product is sold at the original price for 10 units,

then the original selling price is: $100 \times (1 + 20\%) = 120$ (dollars)

The discounted price is: $120 \times 90\% = 108$ (dollars)

The total profit from selling 10 units at the original price is: $(120 - 100) \times 10 = 200$ dollars

After the price reduction, the total profit increases by **20%**, so the new total profit is:

$$200 \times (1 + 20\%) = 240 \text{ dollars}$$

The number of units sold after the price reduction is: $240 \div (108 - 100) = 30$ units

Therefore, the new sales volume is: $30 \div 10 = 3$ times the original

So the answer is **D**.

5 A shop goes to the apple-producing area to purchase apples at a cost of 1.2 dollars per kilogram. The distance from the production site to the shop is 400 km, and the transportation fee is 1.5 dollars per ton per kilometer. If there is a 10% loss during transportation and sales, and the shop wants to earn a profit of 15% based on the purchase cost of the apples, what should the retail price be per kilogram?

- A. 2 dollars B. 2.1 dollars C. 2.2 dollars D. 2.3 dollars E. 2.4 dollars

Answer D

Solution Assume the shop purchases 1 ton of apples, and 1 ton = 1000 kilograms.

$$1000 \times 1.2 + 1 \times 1.5 \times 400 = 1200 + 600 = 1800 \text{ (dollars) } <\text{total cost}>$$

$$1000 \times (1 - 10\%) = 1000 \times 90\% = 900 \text{ (kilograms) } <\text{actual quantity sold}>$$

$$1800 \div 900 = 2 \text{ (dollars) } <\text{cost per kilogram}>$$

$$2 \times (1 + 15\%) = 2 \times 115\% = 2.3 \text{ (dollars) } <\text{retail price per kilogram}>$$

2025 August AMC 8 Week 1 Day 2 - Fractions and Ratios

6 A is $\frac{2}{3}$ of B , and B is $\frac{4}{5}$ of C . What is the ratio of $A : B : C$?

- A. 4 : 5 : 8 B. 4 : 5 : 6 C. 8 : 12 : 15 D. 5 : 6 : 8 E. 4 : 6 : 9

Answer C

Solution The ratio of A to B is $2 : 3 = 8 : 12$

The ratio of B to C is $4 : 5 = 12 : 15$

Therefore, the ratio of $A : B : C$ is $8 : 12 : 15$

Answer: C.

- 7 The unit prices of products *A*, *B*, and *C* are in the ratio **6 : 5 : 4**.

It is known that the unit price of product *A* is **12** dollars more than that of product *C*. What is the sum of the unit prices of the three products?

- A. **75** dollars B. **85** dollars C. **90** dollars D. **95** dollars
E. **100** dollars

Answer C

Solution Since the unit price of product *A* is **12** dollars more than that of product *C*, the difference corresponds to **6 – 4 = 2** parts.

So 1 part is: **$12 \div 2 = 6$ (dollars)**

Then the total unit price of products *A*, *B*, and *C* is: **$6 \times (6 + 5 + 4) = 90$ (dollars)**

So the answer is **C**.

- 8 The combined value of my quarters and nickels is ten times the combined value of my pennies and nickels. If I have the same number of pennies as nickels, my ratio of quarters to pennies is () .

- A. **1 : 1** B. **2 : 1** C. **10 : 3** D. **11 : 5** E. **5 : 3**

Answer D

Solution According to the problem, I can assume a number.

Suppose I have **5** of both **1-cent** and **5-cent** coins.

Then the total value of the **1-cent** and **5-cent** coins is: **$1 \times 5 + 5 \times 5 = 30$ cents**

So the number of **25-cent** coins is: **$(30 \times 10 - 5 \times 5) \div 25 = 11$ coins**

Therefore, the ratio of the number of **25-cent** coins to **1-cent** coins is: **11 : 5**

So the answer is **D**.

9 Two baskets of apples are to be distributed among classes *A*, *B*, and *C*.

Class *A* receives $\frac{2}{5}$ of the total amount. The remaining apples are divided between classes *B* and *C* in a ratio of 5 : 7. It is known that the weight of the second basket is $\frac{9}{10}$ of the first basket and is 5 kilograms less than the first basket. How many kilograms of apples does class *B* receive?

- A. 33 B. 35 C. 23.75 D. 41 E. 30.25

Answer C

Solution Class *A* receives $\frac{2}{5}$ of the total apples, and the remaining amount is divided between classes *B* and *C* in a ratio of 5 : 7.

Then, class *B* receives: $\left(1 - \frac{2}{5}\right) \times \frac{5}{5+7} = \frac{1}{4}$ and class *C* receives:

$$\left(1 - \frac{2}{5}\right) \times \frac{7}{5+7} = \frac{7}{20}$$

The weight of the first basket is: $5 \div \left(1 - \frac{9}{10}\right) = 50 \text{ (kg)}$

So the total weight of the two baskets is: $50 + \frac{9}{10} \times 50 = 95 \text{ (kg)}$

The amount class *B* receives is: $95 \times \frac{1}{4} = 23.75 \text{ (kg)}$

10 A company originally planned to send $\frac{1}{8}$ of its workers to a short-term training program. Later, 2 more people were added, making the ratio of those who actually attended the training to those who did not 1 : 6. How many people were originally planned to attend the training program?

- A. 14 B. 16 C. 30 D. 112 E. 117

Answer A

Solution Let the total number of employees be *x*. According to the problem, the equation can be set

up as: $\left(\frac{1}{8}x + 2\right) : \left(x - \frac{1}{8}x - 2\right) = 1 : 6$

This proportion can be rewritten as:

$$\left(x - \frac{1}{8}x - 2\right) \times 1 = \left(\frac{1}{8}x + 2\right) \times 6$$

Solving the equation gives: $x = 112$

So, the number of people originally planned to attend the training is:

$$\frac{1}{8} \times 112 = 14$$

2025 August AMC 8 Week 1 Day 3 - Mean, Median and Mode

- 11 Given that the average of **2021** different positive integers is **3939**, find the minimum possible value of the largest number among those **2021** positive integers. ()

A. 3939 B. 4042 C. 4949 D. 5960 E. 1

Answer C

Solution $3939 + \frac{2021 - 1}{2} = 4949$.

- 12 The ratio of girls to boys participating in a math competition is **1 : 3**. The overall average score of the competition is **82** points, and the average score of the boys is **80** points. What is the average score of the girls?

A. 82 B. 84 C. 86 D. 88 E. 90

Answer D

Solution Assume the number of girls is **1** and the number of boys is **3**, based on the given ratio.

Using the formula: $\text{average score} = \frac{\text{total score}}{\text{total number of students}}$

we can calculate the total score of all students and the total score of the boys.

Subtracting the boys' total score from the overall total score gives the girls' total score.

Dividing that by the number of girls gives the average score of the girls.

The key to solving this problem is using the relationship:

$$\text{average} = \frac{\text{total score}}{\text{total number of students}}$$

First find the total score and the boys' total score.

Their difference is the girls' total score, and dividing by the number of girls gives the girls' average.

Assume there is 1 girl and 3 boys.

Total score: $82 \times (1 + 3) = 328$ (points)

Boys' total score: $80 \times 3 = 240$ (points)

Girls' average score: $(328 - 240) \div 1 = 88$ (points)

Answer: The average score of the girls is 88 points.

So option **D** is correct.

Therefore, the answer is **D**.

13 There are 3 classes in the sixth grade of a certain elementary school. It is known that: the sum of the average number of students in Class 1 and Class 2 and the number of students in Class 3 is 48, the sum of the average number of students in Class 2 and Class 3 and the number of students in Class 1 is 50, the sum of the average number of students in Class 1 and Class 3 and the number of students in Class 2 is 52. What is the total number of students in the three classes?

- A. 70 B. 72 C. 74 D. 75 E. 77

Answer D

Solution

$$\frac{1}{2} \times (\text{Class 1} + \text{Class 2}) + \text{Class 3} = 48 \quad \textcircled{1}$$

$$\frac{1}{2} \times (\text{Class 2} + \text{Class 3}) + \text{Class 1} = 50 \quad \textcircled{2}$$

$$\frac{1}{2} \times (\text{Class 1} + \text{Class 3}) + \text{Class 2} = 52 \quad \textcircled{3}$$

Adding equations ①, ②, and ③ gives:

$$2 \times (\text{Class 1} + \text{Class 2} + \text{Class 3}) = 150$$

Therefore: $\text{Class 1} + \text{Class 2} + \text{Class 3} = 75$

Lily's average score for the first several math quizzes this semester is **87** points. If she scores **99** points on the final exam, her average math score for the semester (including the final) will increase to **90** points. How many math quizzes (excluding the final) has she taken so far this semester?

- A. 3 B. 4 C. 5 D. 6 E. 7

Answer A

Solution The final exam score is **99** points, and the average will become **90** points.

This means the final exam is **9** points higher than the average, and these **9** extra points can be used to raise the earlier average to **90** as well.

The previous average score was **87**, which is **3** points below **90**.

So the **9** extra points from the final exam can be split into three **3**-point gaps, exactly enough to fill the difference.

Therefore, there were **3** earlier scores of **87**, meaning there were **3** math quizzes before the final.

So the answer is **A**.

15 Amy, Betty, and Celia received a total of **1800** dollars in lucky money during the New Year. Amy gives $\frac{1}{3}$ of their money to Betty, then Betty gives $\frac{1}{4}$ of their current amount to Celia, and then Celia gives $\frac{1}{5}$ of their current amount to Amy. At this point, they have the same amount of money. How much more money did Betty originally have than Celia?

- A. 25 B. 35 C. 45 D. 100 E. 125

Answer A

Solution Since they give money to each other, the total remains unchanged.

After all the exchanges, each person ends up with $1800 \div 3 = 600$ (dollars)

Celia ends up with 600, which is after giving away $\frac{1}{5}$ of their money.

So before giving, Celia had: $600 \div \frac{4}{5} = 750$ (dollars)

Celia gave 150 dollars to Amy, so Amy ends up with 600 (dollars)

This means Amy had 450 after giving away $\frac{1}{3}$ of their money:

Amy's original amount = $450 \div \frac{2}{3} = 675$ (dollars)

Amy gave $675 - 450 = 225$ dollars to Betty.

Betty ends up with $600 \div \frac{3}{4} = 800$ (dollars) (before giving away $\frac{1}{4}$ to Celia)

So Betty originally had: $800 - 225 = 575$ (dollars)

Then Celia's original amount is: $1800 - 675 - 575 = 550$ (dollars).

Therefore, Betty originally had $575 - 550 = 25$ dollars more than Celia.

2025 August AMC 8 Week 2 Day 1 - Distance Word Problems

- 16 Place *A* and Place *B* were 71 km apart. Calvin and Yvonne departed from the two places respectively and travelled towards each other. Calvin started his journey 20 minutes later than Yvonne, but he travelled 3 km/h faster than Yvonne. They met two hours after Calvin departed from Place *A*. Calvin travelled at () km/h.

A. 14 B. 16 C. 18 D. 20 E. 22

Answer C

Solution Let Calvin travel x kilometers per hour, and Yvonne travel $(x - 3)$ kilometers per hour.

$$2x + \frac{7}{3}(x - 3) = 71$$

Solving gives $x = 18$.

$\therefore$ Calvin travels 18 kilometers per hour.

A car travels from City *A* to City *B*. If its speed is increased by 20%, it can arrive one hour earlier than the originally planned time. If it travels 120 kilometers at the original speed and then increases its speed by 25%, it can arrive 40 minutes earlier. What is the distance between City *A* and City *B* in kilometers?

- A. 260 B. 270 C. 280 D. 290 E. 300

Answer B

Solution When the car's speed is increased by 20%, the speed ratio is 5 : 6.

For the same distance, the time ratio should be 6 : 5.

Thus, the time to travel the whole distance at the original planned speed is

$$1 \div (6 - 5) \times 6 = 6 \text{ hours.}$$

For the latter part of the trip, when the speed is increased by 25%, the speed ratio is 4 : 5, so the time ratio should be 5 : 4.

Arriving 40 minutes earlier means that at the original planned speed, this part of the trip would take $40 \times 5 = 200 \text{ minutes} = 3\frac{1}{3} \text{ hours}$.

From this, it is easy to find that the distance between *A* and *B* is

$$120 \div \left(6 - 3\frac{1}{3}\right) \times 6 = 270 \text{ km.}$$

- 18 Henry and Leslie are practicing shuttle runs between points *A* and *B* on the playground. Henry runs at a speed of 8 meters per second, and Leslie runs at 5 meters per second. They start at the same time from point *A*, run to point *B*, and then return. It is known that at their second head-on meeting, the meeting point is 5 meters away from the midpoint of *AB*. What is the distance between *A* and *B* in meters?

- A. 140 B. 150 C. 125 D. 130 E. 135

Answer D

Solution At their second head-on meeting, the two have together run a total of 4 full lengths.

Their speed ratio is $8 : 5$, so Henry has run $4 \times \frac{8}{13} = \frac{32}{13} = 2\frac{6}{13}$ (lengths).

The full length is $5 \div \left(\frac{1}{2} - \frac{6}{13}\right) = 130$ meters.

- 19 At 8:37 in the morning, Yan leaves home on foot to go to school. Three minutes later, the dog starts running to chase him and catches up with him 200 meters from home. After catching up, the dog immediately runs back home, then immediately heads out again to chase Yan, catching him a second time 400 meters from home. After this second catch-up, the dog immediately runs back home again, then immediately heads out to chase Yan once more, and this time catches him exactly at the school. What time does Yan arrive at school?

- A. 8 : 57 a.m. B. 9 : 00 a.m. C. 8 : 55 a.m. D. 8 : 50 a.m.
E. 8 : 40 a.m.

Answer C

Solution Yan's speed is $\frac{200}{3} \times \frac{2}{3} = \frac{400}{9}$.

The time from home to school is $400 \times 2 \div \frac{400}{9} = 18$ minutes.

$$37 + 18 = 55.$$

Therefore, Yan arrives at school at 8:55.

- 20 Point B is to the east of point A . Addy and Brandon start simultaneously from A and B respectively, both moving east at a constant speed. A dog starts from point A at the same time as Addy, running back and forth between them (i.e., running from Addy toward Brandon, turning around after catching up with Brandon to run toward Addy, meeting Addy and then turning around again toward Brandon, and so on). When the dog returns to Addy for the first time, Addy has traveled exactly 140 meters. When the dog returns to Addy for the second time, Addy has traveled a total of 350 meters. If the dog's speed is 3 times the speed of Brandon, then when the dog catches up with Brandon for the third time, what is the distance between A and B ?

- A. 1000 meters B. 1080 meters C. 500 meters D. 800 meters
E. 10000 meters

Answer B

Solution

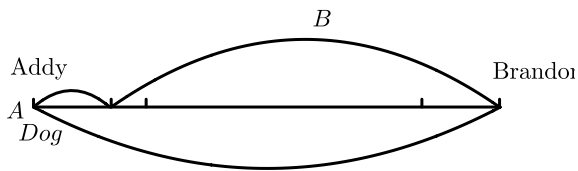


The first time the dog caught up, Addy had traveled **140** meters.

The second time the dog caught up, Addy had traveled **350** meters.

$$140 : (350 - 140) = 2 : 3$$

This shows that when the dog returned to Addy the first time, the distance between Addy and Brandon had become $\frac{3}{2}$ times the original.



Consider the initial **AB** distance as **2** parts.

Time analysis:

$$\begin{cases} \text{Dog chasing Brandon: } 2 \div (3 - 1) = 1 \text{ (part)} \\ \text{Dog meeting Addy: dog gains 3 parts on Brandon} \end{cases}$$

$$3 \div (3 + 1) = \frac{3}{4} \text{ (part)}$$

$$\text{Distance Addy travels: } 3 - \frac{3}{4} \times 3 = \frac{3}{4} \text{ (part)}$$

$$\text{So the speed ratio is: } V_{\text{Addy}} : V_{\text{dog}} = \frac{3}{4} : \left(3 \times 2 - \frac{3}{4} \right) = 1 : 7$$

$$\text{At the first return, the Addy-Brandon distance is: } 140 \div \frac{3}{4} \times 2 \times \frac{3}{2} = 560 \text{ meters}$$

At the second return, the Addy-Brandon distance is:

$$560 \times \frac{3}{2} = 840 \text{ meters}$$

$$\text{The speed ratio is: } V_{\text{Addy}} : V_{\text{Brandon}} : V_{\text{dog}} = 3 : 7 : 21$$

Assume Addy's speed is **3 m/s**, then Brandon's speed is **7 m/s**, and the dog's speed is **21 m/s**.

The time for the dog to catch Brandon the third time is:

$$840 \div (21 - 7) = 60 \text{ seconds}$$

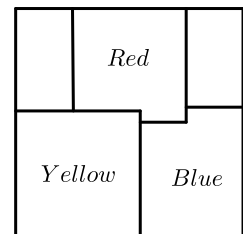
In this time, Brandon travels $60 \times (7 - 3) = 240$ meters more than Addy.

So the Addy–Brandon distance is: $840 + 240 = 1080$ meters

Therefore, the answer is **B**.

2025 August AMC 8 Week 2 Day 2 - Word Problems with Equation

- 21 In a large square with side length not exceeding 8 cm, as shown in the figure, three square sheets of paper, each with an area of 20 cm^2 , are placed inside. The total area covered by these three sheets is 44 cm^2 . What is the area of the large square in square centimeters?



- A. 44 B. 47 C. 49.8 D. 51.2 E. 53.4

Answer D

Solution The red square is translated so that its left side coincides with the left side of the large square. The total area covered by the three squares remains unchanged.

At this point, the large square is divided into four parts. The yellow square has an area of 20 cm^2 .

The exposed rectangular parts of the red and blue squares have equal areas, and their total area is $44 - 20 = 24 \text{ cm}^2$.

Therefore, each of the red and blue rectangles has an area of 12 cm^2 .

Let the uncovered area in the upper-right corner be $x \text{ cm}^2$.

$$\text{Then } \frac{12}{20} = \frac{x}{12}, \quad x = \frac{12 \times 12}{20} = 7.2.$$

Thus, the area of the large square is $44 + 7.2 = 51.2 \text{ cm}^2$.

<i>red</i>	<i>x</i>
<i>yellow</i>	<i>blue</i>

- 22 Amy is reading a novel. She read 1 page on the first day, 2 pages on the second day, 3 pages on the third day, etc, until the total of pages she has read is a multiple of 90. How many pages does she read in total by then?

A. 580 B. 600 C. 630 D. 650 E. 680

Answer C

Solution Let Amy have read $90m$ pages up to day n .

From the problem statement:

$$1 + 2 + 3 + \cdots + n = 90m$$

$$\frac{(n+1)n}{2} = 90m$$

$$(n+1)n = 180m$$

$$n(n+1) = 2^2 \times 3^2 \times 5 \times m$$

$$n(n+1) = 36 \times 5m$$

Therefore, when $m = 7$, $n = 35$.

$$90 \times 7 = 630$$

Answer: Amy read a total of 630 pages, C.

- 23 When computing $m - n$, Yannie mistakenly read the '-' sign as a '+' sign. As a result, her answer differed from the correct answer by 2016. If n is positive, What is the value of n ?

A. 1005 B. 1006 C. 1007 D. 1008 E. 1009

Answer D

Solution $(m + n) - (m - n) = 2016$

$$2n = 2016$$

$$n = 1008 .$$

24 In a kindergarten, there are three classes. Class **A** has 4 more students than Class **B**, and Class **B** has 4 more students than Class **C**. When distributing dates to the children: Each child in Class **A** receives 3 fewer dates than each child in Class **B**; each child in Class **B** receives 5 fewer dates than each child in Class **C**. As a result: Class **A**, in total, receives 3 more dates than Class **B**; Class **B**, in total, receives 5 more dates than Class **C**. How many dates were distributed to the three classes in total?

A. 670

B. 673

C. 676

D. 680

E. 682

Answer B

Solution Let Class **C** have x children. From the given conditions:

Each child in Class **A** receives $3 + 5 = 8$ fewer dates than each child in Class **C**.

Thus, x children in Class **A** receive $8x$ fewer dates than x children in Class **C**.

Since Class **A** in total receives 8 more dates than Class **C**, and Class **A** has 8 more children than Class **C**, these extra 8 children together receive $(8x + 8)$ dates.

Therefore, each child in Class **A** receives $\frac{8x + 8}{8} = x + 1$ dates.

Similarly, x children in Class **B** receive $5x$ fewer dates than x children in Class **C**.

Thus, each child in Class **B** receives $\frac{5x + 5}{4}$ dates.

We then have the equation:

$$x + 1 + 3 = \frac{5x + 5}{4}$$

$$\frac{5}{4}x - x = 4 - \frac{5}{4}$$

Solving gives $x = 11$.

Therefore:

Class **A** has $11 + 8 = 19$ children, each receiving $11 + 1 = 12$ dates.

Class **B** has $11 + 4 = 15$ children, each receiving $12 + 3 = 15$ dates.

Class C has 11 children, each receiving $15 + 5 = 20$ dates.

So, the total number of dates distributed is:

$$12 \times 19 + 15 \times 15 + 20 \times 11 = 673$$

A total of **673** dates were distributed to the three classes.

- 25 On a certain bus route, there are 10 intermediate stops. There are two types of buses: express and local. The express bus travels at 1.2 times the speed of the local bus. The local bus stops at every station, while the express bus stops only at 1 intermediate station. The stop time at each station is 3 minutes. On one occasion, the local bus departs first. Forty minutes later, the express bus departs from the same starting station, and the two buses arrive at the terminal at the same time. How much time does the express bus take from the starting point to the terminal?

A. 68 B. 67 C. 66 D. 65 E. 64

Answer A

Solution Let the distance from the starting point to the terminal be S , and let the speed of the local bus be 1.

The travel time for the local bus is $S \div 1 = S$ (minutes), and the total stopping time is 30 minutes.

From the problem statement: $S + 30 - 40 = \frac{S}{1.2} + 3$

which gives $S = 78$.

Therefore, the express bus takes $78 + 30 - 40 = 68$ minutes from the starting point to the terminal.

2025 August AMC 8 Week 2 Day 3 - Work and Efficiency Problems

In a factory production team working on a batch of parts, if each worker stays at their original position, the task can be completed in 9 hours. If workers *A* and *B* exchange positions while the efficiency of the other workers remains unchanged, the task can be completed 1 hour earlier. If workers *C* and *D* exchange positions while the efficiency of the other workers remains unchanged, the task can also be completed 1 hour earlier. If *A* and *B* exchange positions and *C* and *D* also exchange positions at the same time, with the efficiency of the other workers unchanged, how many minutes earlier can the task be completed?

- A. 90 B. 100 C. 105 D. 108 E. 115

Answer D

Solution Divide the total task into 72 parts.

Originally, the team completed $\frac{72}{9} = 8$ parts per hour, so each part took $\frac{60}{8} = 7.5$ minutes.

After exchanging *A* and *B*, the team completed $\frac{72}{8} = 9$ parts per hour, which is 1 more part per hour than before.

Since the efficiency of the other workers remains unchanged, this extra part is entirely due to the improved combined efficiency of *A* and *B*.

Similarly, after exchanging *C* and *D*, they also completed 1 more part per hour than before, due to the improved combined efficiency of *C* and *D*.

If both exchanges are made at the same time, *A* and *B* and *C* and *D* each contribute an extra part per hour.

Therefore, the team completes $8 + 1 + 1 = 10$ parts per hour, meaning each part takes

$\frac{60}{10} = 6$ minutes to complete.

Thus, for each part, the time saved is $7.5 - 6 = 1.5$ minutes, and for all 72 parts, the total time saved is $72 \times 1.5 = 108$ minutes.

Answer: The task can be completed 108 minutes earlier.

- 27 Two projects of equal workload are completed separately by Team 1 and Team 2. On sunny days, Team 1 can finish a project in 12 days, and Team 2 can finish a project in 15 days. On

rainy days, Team 1's work efficiency decreases by 40%, and Team 2's work efficiency decreases by 10%. In the end, the two teams finish their projects at the same time.

What is the difference between the number of sunny days and rainy days during the work period?

- A. 0 B. 1 C. 2 D. 3 E. 4

Answer E

Solution On sunny days, the work efficiencies of Team 1 and Team 2 are $\frac{1}{12}$ and $\frac{1}{15}$ respectively, so

Team 1's efficiency is higher by $\frac{1}{12} - \frac{1}{15} = \frac{1}{60}$.

On rainy days, their work efficiencies are $\frac{1}{12} \times (1 - 40\%) = \frac{1}{20}$ and $\frac{1}{15} \times (1 - 10\%) = \frac{3}{50}$ respectively, so Team 2's efficiency is higher by $\frac{3}{50} - \frac{1}{20} = \frac{1}{100}$.

From $\frac{\frac{1}{60}}{\frac{1}{100}} = 5 : 3$ we know that in 3 sunny days and 5 rainy days, the progress of the two teams is the same.

During this time, they complete $\frac{1}{12} \times 3 + \frac{1}{20} \times 5 = \frac{1}{2}$ of the work.

Therefore, during the construction period, there were 6 sunny days and 10 rainy days. The difference is 4.

- 28 Addy and Brandon are working together on a project. The original plan was for them to work alternately, one person per day, in the order Addy first, then Brandon, and so on, and the work would be finished in an exact whole number of days. If they instead worked in the order Brandon first, then Addy, alternating one day each, it would take half a day longer than the original plan. Now, if Addy and Brandon work together every day, they can finish the project in $8\frac{2}{3}$ days. If they follow the original plan, how many days will it take to complete the entire task?

- A. 15 B. 16 C. 17 D. 18 E. 19

Answer C

Solution In the original plan, the last day must have been worked by Addy.

If the order is changed to Brandon–Addy–Brandon–Addy . . . , then on what was originally the last day (Addy’s workday), Brandon would work for a full day, and then Addy would work for half a day to finish the job.

Thus, $\text{Addy} = \text{Brandon} + \frac{1}{2}\text{Addy}$ which means $\text{Addy} = 2 \times \text{Brandon}$.

Since $\text{Addy} + \text{Brandon} = \frac{1}{8\frac{2}{3}} = \frac{3}{26}$,

Addy’s and Brandon’s work rates are $\frac{1}{13}$ and $\frac{1}{26}$ respectively.

In the original plan, since the last day is worked by Addy, the days worked by Addy and Brandon before the last day are equal.

Thus, each of them works: $\frac{1 - \frac{1}{13}}{\frac{1}{13} + \frac{1}{26}} = 8 \text{ days}$.

Therefore, under the original plan, the total time to complete the task is: $8 \times 2 + 1 = 17 \text{ days}$.

- 29 For a certain project, Teams **A** and **B** working together can complete $\frac{9}{40}$ of the entire project per day. If Team **A** works alone for 3 days and then Team **B** works alone for 5 days, they can complete $\frac{7}{8}$ of the entire project. If Team **B** works alone, how many days will it take to complete the project?

A. 25 B. 10 C. 15 D. 30 E. 20

Answer B

Solution $(5 - 3) \div (\frac{7}{8} - \frac{9}{40} \times 3) = 10 \text{ days}$.

- 30 In a certain place, there are two ponds, Pond **A** and Pond **B**. Due to planned construction work, the water in both ponds must be pumped out, even during the rainy season. Pond **A** has an area of 2 acres. Using 3 water pumps, it can be emptied in 2 days; if 2 water pumps are used instead, it will take 4 days to empty it. Pond **B** has an area 3 times that of Pond **A**. If it is to be emptied in 6 days, how many water pumps will be needed?

A. 1 B. 2 C. 3 D. 5 E. 10

Answer D

Solution Let the original amount of water in Pond **A** be v , and let the daily rainfall into Pond **A** be x .

Then $\frac{v+2x}{3 \times 2}$ and $\frac{v+4x}{2 \times 4}$ both represent the amount of water a single pump can remove from Pond **A** in one day.

That is: $\frac{v+2x}{6} = \frac{v+4x}{8}$ which gives $v = 4x$, so $x = \frac{v}{4}$.

Therefore, the amount of water one pump can remove from Pond **A** in one day is:

$$\frac{v+2x}{6} = \frac{v+\frac{v}{2}}{6} = \frac{v}{4}.$$

From this and the above, we know that the rainfall into Pond **A** in one day is exactly the amount one pump can remove in one day.

Since Pond **B**'s area is 3 times that of Pond **A**, removing Pond **B**'s daily rainfall requires 3 pumps.

The original amount of water in Pond **B** is $3v$.

Since one pump can remove $\frac{v}{4}$ from Pond **A**'s original water in one day, it would take:

$$\frac{3v}{\frac{v}{4}} = 12 \text{ days for one pump to remove Pond B's original water.}$$

If we want to remove it in 6 days, we need 2 pumps.

Therefore, to remove both the daily rainfall and the original water from Pond **B** in 6 days, we need: $3 + 2 = 5$ pumps.

Arithmetic method

(1) For Pond **A** (including rainfall), using 3 pumps takes 2 days to empty it; to empty it in 1 day requires 6 pumps.

Similarly, using 2 pumps takes 4 days to empty it; to empty it in 1 day requires 8 pumps.

The extra 2 days mean 2 extra days of rainfall, which requires $8 - 6 = 2$ extra pumps.

Therefore, the daily rainfall into Pond **A** requires 1 pump to remove.

If we remove only the original water in Pond **A**, using $3 - 1 = 2$ pumps takes 2 days; using 1 pump takes 4 days.

Thus, each pump removes $\frac{1}{4}$ of Pond **A**'s original water per day.

(2) Since Pond **B** is 3 times the size of Pond **A**, removing its daily rainfall requires 3 pumps.

Also, one pump removes $\frac{1}{4} \div 3 = \frac{1}{12}$ of Pond **B**'s original water per day.

To remove it in 6 days, we need: $\frac{1/6}{1/12} = 2$ pumps.

Therefore, to remove both the rainfall and the original water from Pond *B* in 6 days requires:

$$3 + 2 = 5 \text{ pumps.}$$

Answer: **D**.