

PRACTICE

Answer options as Variables

1. If k years from now George will be l years old, how old was George m years ago?

- $l - k - m$
 $l + (k - m)$
 $l + k - m$
 $k - (l + m)$
 $k + (m - l)$

2. If $2x = 4y = z$, what is $x - y$ in terms of z ?

- $\frac{z}{4}$
 $\frac{z}{2}$
 z
 $2z$
 $4z$

3. A group of x people are in a room. One-third of the people leave the room, and an additional 2 people enter the room. In terms of x , how many people will now be in the room?

- $\left(x - \frac{1}{2}\right) + 2$
 $\frac{2}{3}x + 2$
 $3x + 2$
 $3x + 6$
 $x + 2$

4. What must be added to $\frac{x+y}{2}$ to obtain $\frac{x-y}{2}$?

- $-y$
 $-x$
 $2y$
 $2x$
 $y - x$

5. If $x = 3t - 1$ and $y = 12t^2$, what is y in terms of x ?

- $(x + 1)^2$
 $4(x + 1)^2$
 $\frac{3(x + 1)^2}{4}$
 $\frac{4(x + 1)^2}{3}$
 $(x - 1)^2$

6. $\frac{x^2 + 2x - 8}{x^2 - 6x + 8} =$

- 1
 -1

- $\frac{1}{3}x$
 $\frac{x + 4}{x - 4}$
 $\frac{x + 8}{x - 8}$

7. Copper pipe costs x cents per foot in 8-foot lengths, and $x + y$ cents per foot in shorter lengths. What is the lowest possible price, in cents, of 51 feet of pipe in terms of x and y ?

- $51(x + y)$
 $51x$
 $48x + 3y$
 $48(x + y)$
 $51x + 3y$

Answer Options as Percents

1. Twenty-five percent of the residents of City Y are 65 years old or older. Twenty percent of the residents of City Y who are under the age of 65 are age 18 or younger. What percent of the residents of City Y are between the ages of 18 and 65?

- 15%
- 25%
- 45%
- 60%
- 75%

2. In an election, $\frac{3}{7}$ of the voters voted for Candidate A, and $\frac{3}{5}$ of the remaining voters voted for Candidate B. Of the voters who voted for neither Candidate A nor Candidate B, $\frac{1}{2}$ voted for Candidate C. What fraction of all the votes were cast for Candidate C?

- $\frac{1}{70}$
- $\frac{4}{35}$
- $\frac{9}{35}$
- $\frac{13}{35}$
- $\frac{9}{10}$

3. A parking garage has places for a certain number of cars. If $\frac{1}{5}$ of the places are left empty, and $\frac{2}{5}$ of the places are used by compact cars, non-compact cars take up what fraction of the filled spaces in the garage?

- $\frac{1}{3}$
- $\frac{2}{5}$
- $\frac{1}{2}$
- $\frac{3}{5}$
- $\frac{4}{5}$

4. Fred and Bobbie are book collectors, and Fred has twice as many books as Bobbie does. One-fourth of Fred's books are signed by the authors, and three-fifths of Bobbie's books are signed by the authors. If Fred and Bobbie combine their collections, what fraction of the books are signed by the authors?

- $\frac{11}{30}$
- $\frac{29}{60}$
- $\frac{23}{30}$
- $\frac{17}{20}$
- It cannot be determined.

5. Computer retailer A is selling a computer at a 20 percent discount from its suggested retail price. Computer retailer B promises to match this price and then discount it a further 10 percent. Computer retailer B 's final price is what percent of the suggested retail price?

- 75%
 72%
 70%
 68%
 28%

6. At a certain university, 3 out of every 5 students live in an on-campus dormitory. If one out of every 10 students who do not live in an on-campus dormitory lives in a university-owned apartment, what fractional part of the student body does not live in either an on-campus dormitory or a university-owned apartment?

- $\frac{7}{10}$
 $\frac{1}{2}$
 $\frac{9}{25}$
 $\frac{3}{10}$
 $\frac{7}{25}$

Back Solve

1. If $2x^2 - 2x - 12 = 0$ and $y^2 - 5y + 6 = 0$

when $x = -y$, then what is the value of x ?

- 3
- 2
- 0
- 2
- 3

2. Several persons rented a car for \$30. If there had been one more person in the group, it would have cost each person \$1 less. How many people were in the group originally?

- 5
- 6
- 10
- 12
- 15

3. This year, half of the clients of a certain consulting firm ended up paying the firm exactly \$22,000 each, while the other half ended up paying the firm exactly \$33,000 each. If the firm received a total of \$275,000 from its clients, how many clients does the consulting firm have?

- 9
- 10
- 11
- 12
- 13

4. A certain bakery produces only chocolate and vanilla cupcakes. If the bakery sells 160 cupcakes per day, and 26 more chocolate cupcakes than vanilla cupcakes are sold per day, how many chocolate cupcakes does the bakery sell per day?

- 54
- 67
- 82
- 93
- 106

5. Judy is 26 years old and Diane is 5 years old. In how many years will Judy be twice as old as Diane?

- 16
- 19
- 21
- 24
- 26

6. Pat has a pocket full of quarters, dimes, and nickels. He takes 6 coins out of his pocket that amount to \$0.70. If there are only two denominations of coins among the 6 coins in Pat's hand, how many nickels is he holding?

- 2
- 3
- 4
- 5
- 6

7. On any given Sunday, 75 percent of the people in a city who own TV sets turn them on. Thirty percent of the people who turn their TV sets on watch football. If 9,900 people watch football on Sunday, how many people in the city own TV sets?

- 75,000
- 44,000
- 30,000
- 24,000
- 20,000

ANSWERS AND EXPLANATIONS

Answer options as Variables

- A** Plug in $k = 3$, $l = 10$, and $m = 5$. If George will be 10 in 3 years, he's 7 now. Thus he was 2 (target answer) five years ago.
- A** Plug in. Be sure to choose numbers that make the equation in the question true. Let $x = 6$, $y = 3$, and $z = 12$. In that case, $x - y = 6 - 3 = 3$ (target). Only choice (A) works.
- B** Use Plugging In. The value of x that you plug in should be a multiple of 3; let $x = 12$. If a third of the people leave, that leaves 8; if 2 come in, your new total is 10 (target answer).
- A** If you plug in $x = 3$ and $y = 5$, then $\frac{x+y}{2} = 4$ and $\frac{x-y}{2} = -1$. You have to add -5 (target answer) to 4 in order to get -1 .
- D** Plug in for t first. If $t = 2$, then $x = 5$ and $y = 48$. The question wants the value of y , so 48 is your target answer.
- D** Plug in $x = 3$, and the fraction becomes $\frac{9+6-8}{9-18+8}$, which reduces to $\frac{7}{-1}$, or -7 (target answer).
- E** The 8-foot lengths are less expensive, so you want to get as many as possible: six. If you get six 8-foot lengths, that leaves 3 feet at the more expensive rate. Let $x = 2$ and $y = 3$; the first 48 feet cost \$96, and the remaining 3 feet cost \$5 each, or \$15. Your target answer is \$111.

Answer options as Percents

- D** Plug in 100 for the number of residents. There are 25 people that are 65 or older, and 15 are 18 or younger. There are 60 people in between.
- B** Use the denominators to find the ideal number to plug in for the number of voters: 70. From the data given, 30 choose Candidate A and 24 vote for Candidate B. Of the remaining 16, 8 choose Candidate C. The fraction of voters that vote for C is $\frac{8}{70}$, which reduces to $\frac{4}{35}$.
- C** If there are 25 places in the garage, then there are 5 empty places and 10 of the places have compact cars in them. If you picked (B), you probably misread the question; the question involves the fraction of non-compact cars in the *filled* spaces. There are 10 non-compact cars and 20 filled spaces, so the fraction is $\frac{1}{2}$.
- A** Get rid of (E), which is the Trap Answer. Give Fred 20 books and Bobbie 10 books; 5 of Fred's books are signed and 6 of Bobbie's are signed. The total is 11 out of the 30 books.
- B** Use Plugging In. Let the suggested retail price be \$100. Retailer A sells the computer for \$80, and retailer B sells it for \$72. This second price is a 28 percent discount from the original price. The Trap Answer is (C).
- C** Use Plugging In. It's important to see here that *3 out of 5* is the same thing as $\frac{3}{5}$. If there are 50 students, then 30 live in a dorm and 2 live in an apartment. There are 18 students remaining, and $\frac{18}{50}$ reduces to $\frac{9}{25}$.

Back Solve

- B** Plug In the Answers. (C) can't be right, because 0 doesn't work in either equation. Plug -2 into the first equation [$2(-2)^2 - 2(-2) - 12 = 0$] and plug 2 into the second equation [$(2)^2 - 5(2) + 6 = 0$].
- A** Plug In the Answers. A shrewd eye gravitates to (A) and (B), because $5 \yen 6 = 30$ and $6 - 5 = 1$. (C): 10 people pay \$3 each, and 11 people pay \$2.73 (the difference is too small). (A): 5 people pay \$6 each, and 6 people pay \$5 each.
- B** Plug In the Answers. Get rid of all the odd numbers (because the clients are split in half). Only (B) and (D) are left; try either one. (B): 10 clients means that 5 pay \$22,000 (\$110,000) and 5 pay \$33,000 (\$165,000).
- D** (C) is too small [82 (chocolate) + 56 (vanilla) = 138], but (D) works [$93 + 67 = 160$].
- A** In 21 years, Judy is 47 and Diane is 26. Judy is less than twice as old as Diane, so (C) is too big. (A): In 16 years, Judy is 42 and Diane is 21.
- C** Pat has to have quarters in his pocket (otherwise, you can't have 70 cents with only 6 coins). (C) If he has 4 nickels, the other two coins must be quarters: $4 \yen .05 = .20$, and $2 \yen .25 = .50$.
- B** If 30,000 own sets, then 22,500 of them are on and 6,750 are tuned to football: too small. (B): If 44,000 people own sets, then 33,000 are on and 9,900 have the football game on.