

*Category 5 Percents*

1. What is 37.5 percent of  $\frac{2}{3}$ ?

(A)  $\frac{1}{8}$

(B)  $\frac{1}{4}$

(C)  $\frac{3}{8}$

(D)  $\frac{1}{2}$

(E)  $\frac{3}{4}$

2. If 18 is 15 percent of 30 percent of a certain number, what is the number?

(A) 9

(B) 36

(C) 40

(D) 81

(E) 400

3. In a recent survey 65 percent of those responding were in favor of recycling. If 780 people were in favor of recycling, how many responded to the survey?

(A) 1,287

(B) 1,200

(C) 900

(D) 845

(E) 507

4. If  $x$  is 11 percent greater than 80, then  $x =$

- (A) 70.9
- (B) 71.2
- (C) 88.0
- (D) 88.8
- (E) 91.0

5. What is 25 percent of 20 percent of 75?

- (A) 3.75
- (B) 15
- (C) 18.75
- (D) 25
- (E) 33.75

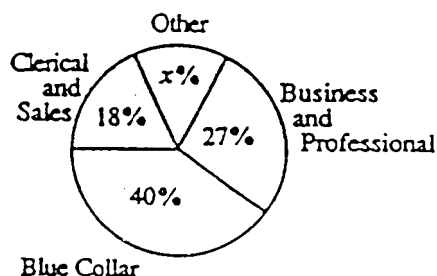
6. If 70 percent of 600 is 40 percent of  $x$ , then  $x =$

- (A) 105
- (B) 168
- (C)  $342\frac{6}{7}$
- (D) 660
- (E) 1,050

7. Last year if 97 percent of the revenues of a company came from domestic sources and the remaining revenues, totaling \$450,000, came from foreign sources, what was the total of the company's revenues?
- (A) \$1,350,000  
(B) \$1,500,000  
(C) \$4,500,000  
(D) \$15,000,000  
(E) \$150,000,000
8. A certain telescope increases the visual range at a particular location from 90 kilometers to 150 kilometers. By what percent is the visual range increased by using the telescope?
- (A) 30%  
(B)  $33\frac{1}{2}\%$   
(C) 40%  
(D) 60%  
(E)  $66\frac{2}{3}\%$
9. If  $x > 0$ ,  $\frac{x}{50} + \frac{x}{25}$  is what percent of  $x$ ?
- (A) 6%  
(B) 25%  
(C)  $37\frac{1}{2}\%$   
(D) 60%  
(E) 75%

10. If Juan sold 100 of the 15,522 shares of stock that he held, approximately what percent of his shares did he sell?
- (A) 0.3%
  - (B) 0.6%
  - (C) 0.9%
  - (D) 1.2%
  - (E) 1.5%
11. A store reported total sales of \$385 million for February of this year. If the total of sales for the same month last year was \$320 million, approximately what was the percent increase in sales?
- (A) 2%
  - (B) 17%
  - (C) 20%
  - (D) 65%
  - (E) 83%
12. In a certain fund, 40 percent of the money is invested in stocks, and of that portion, 20 percent is invested in preferred stocks. If the fund has \$576 invested in preferred stocks, what is the total amount of the fund?
- (A) \$960
  - (B) \$1,440
  - (C) \$2,880
  - (D) \$4,608
  - (E) \$7,200

13. A certain tax rate is \$0.82 per \$100.00. What is this rate, expressed as a percent?
- (A) 82%                      (B) 8.2%                      (C) 0.82%  
(D) 0.082%                      (E) 0.0082%
14. A mouse treated with a certain growth hormone weighs  $1\frac{1}{2}$  ounces, and an untreated mouse weighs  $\frac{3}{4}$  ounce. The weight of the treated mouse is what percent of the weight of the untreated mouse?
- (A) 50%  
(B) 112.5%  
(C) 150%  
(D) 200%  
(E) 225%



15. The graph above shows the percent of the people in a certain survey who belonged to each of four occupational categories. Of those surveyed, if 160 were in blue-collar occupations, how many were in occupations classified as “Other”?
- (A) 15  
(B) 24  
(C) 60  
(D) 70  
(E) 240

16. An employee of Company  $X$  is entitled to a disability benefit equal to the sum of 60 percent of the first \$2,000 of monthly salary and 40 percent of the amount of monthly salary in excess of \$2,000. What is the monthly salary of an employee who receives \$1,400 in disability benefits under this plan
- (A) \$1,700  
(B) \$2,200  
(C) \$2,240  
(D) \$2,500  
(E) \$3,000

<High Level Questions>

17. In January 1981 the cost of dictating and transcribing a business letter was \$6.60, a 10 percent increase over the cost in January 1980. If the percent increase from January 1979 to January 1980 was  $\frac{6}{10}$  of a percentage point less than the percent increase from January 1980 to January 1981, approximately what was the cost of dictating and transcribing a business letter in January 1979?
- (A) \$3.96  
(B) \$5.48  
(C) \$5.60  
(D) \$5.94  
(E) \$6.00
18. In 1986 the book value of a certain car was  $\frac{2}{3}$  of the original purchase price, and in 1988 its book value was  $\frac{1}{2}$  of the original purchase price. By what percent did the book value of this car decrease from 1986 to 1988?
- (A)  $16\frac{2}{3}\%$   
(B) 25%  
(C)  $33\frac{1}{3}\%$   
(D) 50%  
(E) 75%

19. The organizers of a fair projected a 25 percent increase in attendance this year over that of last year, but attendance this year actually decreased by 20 percent. What percent of the projected attendance was the actual attendance?
- (A) 45%  
(B) 56%  
(C) 64%  
(D) 75%  
(E) 80%
20. On the first business day of a certain week, the opening price of a stock was  $27\frac{1}{8}$  and the closing price was  $32\frac{3}{4}$ ; on the second day, the opening price was  $32\frac{3}{4}$  and the closing price was  $30\frac{7}{8}$ . The decrease in price on the second day was what percent of the increase in price on the first day?
- (A) 25%  
(B)  $33\frac{1}{3}\%$   
(C) 40%  
(D) 50%  
(E)  $66\frac{2}{3}\%$
21. A circle graph shows how the budget of a certain company was spent: 63 percent for salaries, 12 percent for research and development, 6 percent for utilities, 5 percent for equipment, 4 percent for supplies, and the remainder for transportation. If the area of each sector of the graph is proportional to the percent of the budget it represents, how many degrees of the circle are used to represent transportation?
- (A)  $10^\circ$   
(B)  $18^\circ$   
(C)  $36^\circ$   
(D)  $90^\circ$   
(E)  $324^\circ$

22. Mr. Kranter, the losing candidate in a two-candidate election, received 942,568 votes, which was exactly 40 percent of all the votes cast. Approximately what percent of the remaining votes would he need to have received in order to have won at least 50 percent of all the votes cast?
- (A) 10%  
(B) 12%  
(C) 15%  
(D) 17%  
(E) 20%
23. In year  $Y$  imported machine tools accounted for 25 percent of total machine-tool sales in the United States, and Japanese imports accounted for 45 percent of the sales of imported machine tools. If the total sales of machine tools imported from Japan that year was  $x$  billion dollars, then the total sales of all machine tools in the United States was how many billion dollars?
- (A)  $\frac{9x}{80}$   
(B)  $\frac{13x}{20}$   
(C)  $\frac{80}{9x}$   
(D)  $\frac{20x}{13}$   
(E)  $\frac{80x}{9}$
24. Ann can have her bicycle repaired for \$50, or she can trade it in, as is, and receive \$22 credit toward the purchase of a new bicycle that sells for \$107. If Ann trades in her current bicycle, the cost to her of purchasing the new bicycle is what percent greater than the cost of having her current bicycle repaired?
- (A) 44%  
(B) 60%  
(C) 70%  
(D) 114%  
(E) 170%



25. The original retail price of an appliance was 60 percent more than its wholesale cost. If the appliance was actually sold for 20 percent less than the original retail price, then it was sold for what percent more than its wholesale cost?
- (A) 20%  
(B) 28%  
(C) 36%  
(D) 40%  
(E) 42%
26. The cost  $C$  of manufacturing a certain product can be estimated by the formula  $C = 0.03rst^2$ , where  $r$  and  $s$  are the amounts, in pounds, of the two major ingredients and  $t$  is the production time, in hours. If  $r$  is increased by 50 percent,  $s$  is increased by 20 percent, and  $t$  is decreased by 30 percent, by approximately what percent will the estimated cost of manufacturing the product change?
- (A) 40% increase  
(B) 12% increase  
(C) 4% increase  
(D) 12% decrease  
(E) 24% decrease
27. In a certain community, 39,285 more apartments were converted to condominiums and sold in 1981 than in 1980. If this was a 30 percent increase, how many apartments were converted and sold in 1981?
- (A) 11,786  
(B) 51,070  
(C) 91,665  
(D) 130,950  
(E) 170,235

28. If the length and width of a rectangular diagram 12 inches by 8 inches are to be reduced by the same percent so that the diagram will exactly fit into a rectangular space 4.5 inches by 3 inches, by what percent should the dimensions be reduced?
- (A) 25%  
(B) 37.5%  
(C) 62.5%  
(D) 75%  
(E) 87.5%
29. In a certain orchestra, 30 percent of the musicians can play the violin and 24 percent can play the piano. If  $\frac{1}{3}$  of those who can play the violin can also play the piano, what percent of the orchestra musicians can play neither the violin nor the piano?
- (A) 36%  
(B) 44%  
(C) 46%  
(D) 54%  
(E) 56%
30. In an office, 40 percent of the workers have at least 5 years of service, and a total of 16 workers have at least 10 years of service. If 90 percent of the workers have fewer than 10 years of service, how many of the workers have at least 5 but fewer than 10 years of service?
- (A) 48  
(B) 64  
(C) 80  
(D) 144  
(E) 160

31. A factory has 500 workers, 12 percent of whom are women. If 80 additional workers are to be hired and all of the present workers remain, what percent of the new workers must be women in order to raise the total percent of female workers to 20 percent?
- (A) 70%  
 (B) 50%  
 (C) 32%  
 (D) 20%  
 (E) 8%

$Q$ 40%		$R$ 10%
$P$ 30 %	$S$ 20%	

32. A rectangular parcel of land is divided into four lots,  $P$ ,  $Q$ ,  $R$ , and  $S$ , as shown above. If 25 percent of the entire parcel of land is plowed and this includes 20 percent of lot  $P$ , what percent of the plowed land is not in lot  $P$ ?
- (A) 5%  
 (B) 6%  
 (C) 10%  
 (D) 76%  
 (E) 80%
33. In a certain pond, 50 fish were caught, tagged, and returned to the pond. A few days later, 50 fish were caught again, of which 2 were found to have been tagged. If the percent of tagged fish in the second catch approximates the percent of tagged fish in the pond, what is the approximate number of fish in the pond?
- (A) 400  
 (B) 625  
 (C) 1,250  
 (D) 2,500  
 (E) 10,000

**STOP**



### Category 5 Percents

1. What is 37.5 percent of  $\frac{2}{3}$ ?

- (A)  $\frac{1}{8}$     (B)  $\frac{1}{4}$     (C)  $\frac{3}{8}$     (D)  $\frac{1}{2}$     (E)  $\frac{3}{4}$

Percent      가      . 37.5%      0.375      .      percent  
decimal      .      decimal      percent

$$. 0.375 \times \frac{2}{3} = 0.25, \quad \frac{1}{4}$$



(B)

2. If 18 is 15 percent of 30 percent of a certain number, what is the number?

- (A) 9    (B) 36    (C) 40    (D) 81    (E) 400

$$18 = 0.15 \times 0.3 \times X, \quad X = 400$$



(E)

3. In a recent survey 65 percent of those responding were in favor of recycling. If 780 people were in favor of recycling, how many responded to the survey?

- (A) 1,287  
(B) 1,200  
(C) 900  
(D) 845  
(E) 507

65%가 recycling      ,      65%      780  
T 가      ,       $T \times 0.65 = 780$

$$T = 1,200$$



(B)

4. If  $x$  is 11 percent greater than 80, then  $x =$

- (A) 70.9
- (B) 71.2
- (C) 88.0
- ☒ (D) 88.8
- (E) 91.0

$x$  is 11% greater than 80. 11% of 80 is 8.8. 100% of 80 is 80. 111% of 80 is 88.8.  $X = 1.11 \times 80$ , then  $X = 88.8$

 (D)

5. What is 25 percent of 20 percent of 75?

- ☒ (A) 3.75
- (B) 15
- (C) 18.75
- (D) 25
- (E) 33.75

$X = 0.25 \times 0.2 \times 75$ ,  $x = 3.75$

 (A)

6. If 70 percent of 600 is 40 percent of  $x$ , then  $x =$

- (A) 105
- (B) 168
- (C)  $342\frac{6}{7}$
- (D) 660
- ☒ (E) 1,050

$0.7 \times 600 = 0.4 \times x$ ,  $x = 1,050$

 (E)

7. Last year if 97 percent of the revenues of a company came from domestic sources and the remaining revenues, totaling \$450,000, came from foreign sources, what was the total of the company's revenues?

- (A) \$1,350,000  
 (B) \$1,500,000  
 (C) \$4,500,000  
 (D) \$15,000,000  
 (E) \$150,000,000

97% = domestic sources,

3% = foreign sources = \$450,000, 3%가 \$450,000 .

$$(\text{revenues}) \times 0.3 = \$45,000 \Rightarrow \text{revenues} = \$15,000,000$$



(D)

8. A certain telescope increases the visual range at a particular location from 90 kilometers to 150 kilometers. By what percent is the visual range increased by using the telescope?

- (A) 30% (B)  $33\frac{1}{2}\%$  (C) 40% (D) 60% (E)  $66\frac{2}{3}\%$

$$\% \text{ 가} = \frac{\text{가}}{(\text{ -- })}$$

$$\frac{150 - 90}{90} = \frac{60}{90} = 66\frac{2}{3}\%$$



(E)

9. If  $x > 0$ ,  $\frac{x}{50} + \frac{x}{25}$  is what percent of  $x$ ?

- (A) 6% (B) 25% (C)  $37\frac{1}{2}\%$  (D) 60% (E) 75%

$$\frac{x}{50} + \frac{x}{25} = \frac{3}{50}x \text{ 가 } x \text{ \%} \quad \frac{3}{50} = 0.06 = 6\%$$

$$\text{Percent} = \frac{\text{part}}{\text{whole}} = \frac{\frac{3}{50}x}{x} = 0.06 = 6\%$$



(A)

10. If Juan sold 100 of the 15,522 shares of stock that he held, approximately what percent of his shares did he sell?

(A) 0.3% (B) 0.6% (C) 0.9% (D) 1.2% (E) 1.5%

$$\text{Percent} = \frac{\text{part}}{\text{whole}} = \frac{100}{15,522} = 0.0065 \approx 0.6\%$$



(B)

Tip!! decimal percent  $\Rightarrow$  , ex) 0.93 = 93%

11. A store reported total sales of \$385 million for February of this year. If the total of sales for the same month last year was \$320 million, approximately what was the percent increase in sales?

(A) 2%  
(B) 17%  
(C) 20%  
(D) 65%  
(E) 83%

$$\frac{\$385\text{million} - \$320\text{million}}{\$320\text{million}} \approx 0.20 = 20\%$$



(C)

12. In a certain fund, 40 percent of the money is invested in stocks, and of that portion, 20 percent is invested in preferred stocks. If the fund has \$576 invested in preferred stocks, what is the total amount of the fund?

(A) \$960  
(B) \$1,440  
(C) \$2,880  
(D) \$4,608  
(E) \$7,200

fund 40% stocks , 40% 20% preferred stocks  
preferred stocks \$576 . fund .

$$\text{fund } T \text{ 가 } , T \times 0.4 \times 0.2 = \$576 . \quad T = \$7,200$$



(E)

13. A certain tax rate is \$0.82 per \$100.00. What is this rate, expressed as a percent?

- (A) 82%  
 (B) 8.2%  
 (C) 0.82%  
 (D) 0.082%  
 (E) 0.0082%

$$\text{tax rate} = \frac{\$0.82}{\$100} = 0.0082 = 0.82\%$$



(C)

14. A mouse treated with a certain growth hormone weighs  $1\frac{1}{2}$  ounces, and an untreated mouse

weighs  $\frac{3}{4}$  ounce. The weight of the treated mouse is what percent of the weight of the

untreated mouse?

- (A) 50%  
 (B) 112.5%  
 (C) 150%  
 (D) 200%  
 (E) 225%

$$\therefore \text{Percent} = \frac{\text{treated}}{\text{untreated}},$$

“\_” % “\_” 가 가 .

$$\% = \frac{\frac{3}{2}}{\frac{3}{4}} = 2 = 200 \%$$

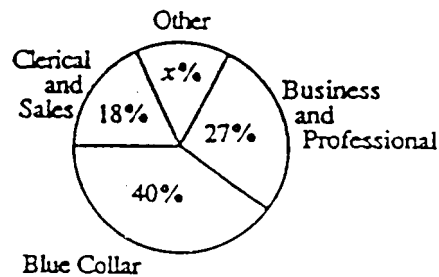
가

!



(D)





15. The graph above shows the percent of the people in a certain survey who belonged to each of four occupational categories. Of those surveyed, if 160 were in blue-collar occupations, how many were in occupations classified as “Other”?

(A) 15  
 (B) 24  
 (C) 60  
 (D) 70  
 (E) 240

$$40\% + 27\% + 18\% + X(\text{other}) = 100, \quad X(\text{other}) = 15\%$$

$$T \text{ 가 } , T \times 0.4 (=40\%) = 160 \quad T = 400$$

$$\text{others} \quad 400 \times 15\% (=0.15) = 60$$



(C)

16. An employee of Company  $X$  is entitled to a disability benefit equal to the sum of 60 percent of the first \$2,000 of monthly salary and 40 percent of the amount of monthly salary in excess of \$2,000. What is the monthly salary of an employee who receives \$1,400 in disability benefits under this plan

(A) \$1,700  
 (B) \$2,200  
 (C) \$2,240  
 (D) \$2,500  
 (E) \$3,000

$$\therefore \text{Disability benefit} = 60\% \times \$2,000 + 40\% \times (\text{monthly salary} - \$2,000)$$

.

$$\text{employee가 } \$1,400 \text{ disability benefits} \quad \text{monthly salary}$$

$$S \text{ 가 } ,$$

$$\$1,400 = \$1,200 (0.6 \times \$2,000) + 0.4 \times (S - \$2,000), \quad S = \$2,500$$



(D)

## &lt;High Level Questions &gt;

17. In January 1981 the cost of dictating and transcribing a business letter was \$6.60, a 10 percent increase over the cost in January 1980. If the percent increase from January 1979 to January 1980 was  $\frac{6}{10}$  of a percentage point less than the percent increase from January 1980 to January 1981, approximately what was the cost of dictating and transcribing a business letter in January 1979?

(A) \$3.96 (B) \$5.48 (C) \$5.60 (D) \$5.94 (E) \$6.00

81 1 \$6.60 80 1 10%가 가 .  
 80 1  $x \times 1.1 = \$6.6 \Rightarrow x = \$6.00$  , 79 1 80 1  
 가 80 1 81 1 가 10% 1%(a  
 percentage point)  $\frac{6}{10}$  . 1%  $\frac{6}{10}$  0.6% (0.006) . 79  
 1 80 1 가 10% - 0.6% = 9.4% .  
 79 1  $y \times 1.094 = \$6 \Rightarrow y \approx \$5.4844$   
 (B)

18. In 1986 the book value of a certain car was  $\frac{2}{3}$  of the original purchase price, and in 1988 its book value was  $\frac{1}{2}$  of the original purchase price. By what percent did the book value of this car decrease from 1986 to 1988?

(A)  $16\frac{2}{3}\%$  (B) 25% (C)  $33\frac{1}{3}\%$  (D) 50% (E) 75%

% = ( -- )

%  

$$\% = \frac{\frac{2}{3} - \frac{1}{2}}{\frac{2}{3}} = \frac{1}{4} = 25\%$$

(B)

19. The organizers of a fair projected a 25 percent increase in attendance this year over that of last year, but attendance this year actually decreased by 20 percent. What percent of the projected attendance was the actual attendance?

(A) 45% (B) 56% (C) 64% (D) 75% (E) 80%

$$\text{Percent}(\%) = \frac{\text{part}}{\text{whole}}, \quad \text{whole} = \text{projected attendance}, \quad \text{part} = \text{actual attendance}$$

$$\times 125\% (=1.25) = 1.25A \quad \text{actual attendance } A \quad 20\% \text{ decrease} \quad A \times 80\% (=0.8)$$

$$= 0.8A \quad \text{percent} \quad \frac{0.8A}{1.25A} = 0.64 = 64\%$$

⏏ (C)

20. On the first business day of a certain week, the opening price of a stock was  $27\frac{1}{8}$  and the closing price was  $32\frac{3}{4}$ ; on the second day, the opening price was  $32\frac{3}{4}$  and the closing price was  $30\frac{7}{8}$ . The decrease in price on the second day was what percent of the increase in price on the first day?

(A) 25% (B)  $33\frac{1}{3}\%$  (C) 40% (D) 50% (E)  $66\frac{2}{3}\%$

A (the decrease in price) is what percent of B (the increase in price)?

$$\text{Percent}(\%) = \frac{\text{part}}{\text{whole}} = \frac{A}{B}$$

decimal 8

$$27\frac{1}{8} = \frac{217}{8}, \quad 32\frac{3}{4} = \frac{262}{8}, \quad 30\frac{7}{8} = \frac{247}{8}$$

217, 262, 247

$$\frac{15(262 - 247)}{45(262 - 217)} = 33\frac{1}{3}\%$$

⏏ (B)

21. A circle graph shows how the budget of a certain company was spent: 63 percent for salaries, 12 percent for research and development, 6 percent for utilities, 5 percent for equipment, 4 percent for supplies, and the remainder for transportation. If the area of each sector of the graph is proportional to the percent of the budget it represents, how many degrees of the circle are used to represent transportation?

(A)  $10^\circ$  (B)  $18^\circ$  (C)  $36^\circ$  (D)  $90^\circ$  (E)  $324^\circ$

the remainder for transportation percent  $10\% (= 100\% - (63+12+6+5+4))$

percent circle  $100 : 10 = 360 : x$   $x = 36$

(C)

22. Mr. Kranter, the losing candidate in a two-candidate election, received 942,568 votes, which was exactly 40 percent of all the votes cast. Approximately what percent of the remaining votes would he need to have received in order to have won at least 50 percent of all the votes cast?

(A) 10% (B) 12% (C) 15% (D) 17% (E) 20%

All the votes cast =  $V$  Mr. Kranter

$0.5V$  40%,  $0.4V$ ,

$0.5V$   $0.1V$   $: 0.5V = 0.4V + 0.1V$ .

942,568 votes votes cast 40% votes

60%  $0.6V$   $0.1V$  percent  $!$

$$\frac{0.1V}{0.6V} = 0.17 = 17\%$$

(D)

23. In year  $Y$  imported machine tools accounted for 25 percent of total machine-tool sales in the United States, and Japanese imports accounted for 45 percent of the sales of imported machine tools. If the total sales of machine tools imported from Japan that year was  $x$  billion dollars, then the total sales of all machine tools in the United States was how many billion dollars?

(A)  $\frac{9x}{80}$  (B)  $\frac{13x}{20}$  (C)  $\frac{80}{9x}$  (D)  $\frac{20x}{13}$  (E)  $\frac{80x}{9}$

The total sales of all machine tools =  $T$  imported machine tools  $0.25T$  Japanese

imports  $0.25 \times 0.45T = 0.1125T = x$  billion dollars,  $0.1125T = x$   $T$  :

$$T = \frac{x}{0.1125} = x \times 8.8888 \dots$$



(E)

24. Ann can have her bicycle repaired for \$50, or she can trade it in, as is, and receive \$22 credit toward the purchase of a new bicycle that sells for \$107. If Ann trades in her current bicycle, the cost to her of purchasing the new bicycle is what percent greater than the cost of having her current bicycle repaired?

- (A) 44%  
 (B) 60%  
 (C) 70%  
 (D) 114%  
 (E) 170%

The purchasing of the new bicycle = \$107 - \$22 = \$85

The cost of having her current bicycle repaired = \$50

$$\frac{85}{50} = 1.7 = 170\%$$

70%가



(C)

25. The original retail price of an appliance was 60 percent more than its wholesale cost. If the appliance was actually sold for 20 percent less than the original retail price, then it was sold for what percent more than its wholesale cost?

- (A) 20%  
 (B) 28%  
 (C) 36%  
 (D) 40%  
 (E) 42%

The original retail price =  $1.6 \times \text{wholesale cost}$

$$\text{price} = 0.8 \times (\text{the original retail price}) = 0.8 \times 1.6 \times \text{wholesale price}$$

$$\text{price} = 1.28 \times \text{wholesale price,} \quad \text{가} \quad \text{wholesale price} \quad 28\%$$



(B)

26. The cost  $C$  of manufacturing a certain product can be estimated by the formula  $C = 0.03rst^2$ , where  $r$  and  $s$  are the amounts, in pounds, of the two major ingredients and  $t$  is the production time, in hours. If  $r$  is increased by 50 percent,  $s$  is increased by 20 percent, and  $t$  is decreased by 30 percent, by approximately what percent will the estimated cost of manufacturing the product change?

- (A) 40% increase  
 (B) 12% increase  
 (C) 4% increase  
 (D) 12% decrease  
 (E) 24% decrease

$$C = 0.03rst^2 \quad r \rightarrow 1.5r, \quad s \rightarrow 1.2s, \quad t \rightarrow 0.7t$$

$$1.5 \cdot 1.2 \cdot 0.49 = 0.8820 \quad C \rightarrow 12\%$$

 (D)

27. In a certain community, 39,285 more apartments were converted to condominiums and sold in 1981 than in 1980. If this was a 30 percent increase, how many apartments were converted and sold in 1981?

- (A) 11,786  
 (B) 51,070  
 (C) 91,665  
 (D) 130,950  
 (E) 170,235

$$\begin{aligned} 1980 &= A \text{ 가} \\ 1981 &= A + 39,285 \end{aligned}$$

$$\frac{39,285}{A} = \frac{30\%}{100\%} \Rightarrow \frac{39,285}{A} = 0.3 \Rightarrow A = 130,950$$

$$30\% (0.3) = \frac{(A + 39,285) - A}{A} \Rightarrow 0.3A = 39,285 \Rightarrow A = 130,950$$

$$A \text{ (1980)} = 130,950 \quad 1981 = 130,950 + 39,285 \text{ (가)} = 170,235$$

 (E)

28. If the length and width of a rectangular diagram 12 inches by 8 inches are to be reduced by the same percent so that the diagram will exactly fit into a rectangular space 4.5 inches by 3 inches, by what percent should the dimensions be reduced?

(A) 25%  
 (B) 37.5%  
 (C) 62.5%  
 (D) 75%  
 (E) 87.5%

$$\frac{12 \text{ inches}}{\text{percent}} \times \frac{8 \text{ inches}}{\text{percent}} = \frac{4.5 \text{ inches}}{\text{percent}} \times \frac{3 \text{ inches}}{\text{percent}}$$

$$\Rightarrow x = 0.3750 (37.5\%)$$

$$\frac{12 \text{ inches}}{10,000} \times 37.5\% = \frac{4.5 \text{ inches}}{10,000} \times 62.5\%$$

$$= 4,000 \quad 60\%$$

(C)

29. In a certain orchestra, 30 percent of the musicians can play the violin and 24 percent can play the piano. If  $\frac{1}{3}$  of those who can play the violin can also play the piano, what percent of the orchestra musicians can play neither the violin nor the piano?

(A) 36% (B) 44% (C) 46% (D) 54% (E) 56%

$$\text{Musicians } M \text{ violin } 0.3M,$$

$$0.24M, \quad \frac{1}{3} \times 30\% = 10\% = 0.1M$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B) \Rightarrow 0.3M + 0.24M - 0.1M = 0.44M$$

$$\text{musicians } 44\%$$

$$A \cup B = U - (A \cap B) = A^c \cap B^c = (A \cap B)^c$$

(E)

30. In an office, 40 percent of the workers have at least 5 years of service, and a total of 16 workers have at least 10 years of service. If 90 percent of the workers have fewer than 10 years of service, how many of the workers have at least 5 but fewer than 10 years of service?

- (A) 48  
(B) 64  
(C) 80  
(D) 144  
(E) 160

90% of workers = 10 workers, 10% of 100 = 10 workers  $\Rightarrow$  16 workers  
 40% of 100 = 40 workers  
 $40 - 16 = 24$   
 $\therefore 24 \times 2 = 48$

(A)

31. A factory has 500 workers, 12 percent of whom are women. If 80 additional workers are to be hired and all of the present workers remain, what percent of the new workers must be women in order to raise the total percent of female workers to 20 percent?

- (A) 70%  
(B) 50%  
(C) 32%  
(D) 20%  
(E) 8%

500 workers	580 workers(80 )
12%(=60 ) female	20%(=116 ) female
	Female workers 가 56 가

80 56 female workers가

$$\frac{56}{80} = 0.7 = 70\%$$

(A)



$Q$ 40%		$R$ 10%
$P$ 30 %	$S$ 20%	

32. A rectangular parcel of land is divided into four lots,  $P$ ,  $Q$ ,  $R$ , and  $S$ , as shown above. If 25 percent of the entire parcel of land is plowed and this includes 20 percent of lot  $P$ , what percent of the plowed land is not in lot  $P$ ?
- (A) 5%      (B) 6%      (C) 10%      (D) 76%      (E) 80%

25%가 P 20%가 . P가  
 $0.3 \times 0.2 = 0.06 = 6\%$  (plowed land 25% P가 6% )  
 P가

$$\frac{19(25\% - 6\%)}{25\%} = 76\%$$

☞ (D)

33. In a certain pond, 50 fish were caught, tagged, and returned to the pond. A few days later, 50 fish were caught again, of which 2 were found to have been tagged. If the percent of tagged fish in the second catch approximates the percent of tagged fish in the pond, what is the approximate number of fish in the pond?
- (A) 400  
 (B) 625  
 (C) 1,250  
 (D) 2,500  
 (E) 10,000

$$N : \frac{50}{N} = \frac{2}{50} \Rightarrow N = 1,250$$

☞ (C)

**STOP**