

No. of Questions : 50  
No. of Printed Pages : 16

2018  
AH/OS (1st)

*R...*  
Secretary

Roll No. ....

Booklet Sl. No. : .....

Time : 1 hour 15 Minutes  
Full Marks : 50

SET :

C

ସମୟ : 1 ଘଣ୍ଟା 15 ମିନିଟ୍  
ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା : 50

REG. – 2018 / EX-REG. - 2014 COURSE

ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକାଟି ଉତ୍ତର HSC ଓ ରାଜ୍ୟ ମୁକ୍ତ ବିଦ୍ୟାଳୟ ପରୀକ୍ଷାର୍ଥୀଙ୍କ ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ ।

ନିରୀକ୍ଷକଙ୍କ ନିମନ୍ତେ ସୂଚନା

SPECIAL INSTRUCTION TO THE INVIGILATORS

ଉକ୍ତ ବିଷୟର ପରୀକ୍ଷା ସରିବାପରେ ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକା (PART - I - OBJECTIVE) ଟିକୁ ପରୀକ୍ଷାର୍ଥୀମାନେ ସାଥରେ ନେବେ । ପରୀକ୍ଷା ଗୂଢ଼ ଛାଡ଼ିବା ପୂର୍ବରୁ ନିରୀକ୍ଷକମାନେ ତାହାକୁ ଠିକ୍ ଭାବେ ଚଢ଼ାଉଣ କରିବା ଏକାନ୍ତ ଜରୁରୀ ।

The Candidates shall take away this Question Booklet (PART - I - OBJECTIVE) after the examination of this subject is over. It is important that the invigilators should verify the Booklet of the candidates before leaving the examination hall/room.

PART - I – OBJECTIVE (MCQ)

OBJECTIVE QUESTION BOOKLET

AR/AXR – 15 – MTH / OS – 07 – MT

MTH – MATHEMATICS / MT – MATHEMATICS

C

SET

ପରୀକ୍ଷାର୍ଥୀଙ୍କ ନିମନ୍ତେ ସୂଚନା

INSTRUCTION TO CANDIDATES

ଏହି ପ୍ରଶ୍ନପତ୍ର ପୁସ୍ତିକାରେ 50ଟି ବହୁବିକଳ୍ପ ଉତ୍ତରମୂଳକ ପ୍ରଶ୍ନ ଦିଆଯାଇଛି । ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନର ଉତ୍ତର OMR ଫର୍ମରେ ଥିବା ନିର୍ଦ୍ଦେଶାନୁସାରେ ଦେବା ଆବଶ୍ୟକ ।

This Question-Booklet contains 50 multiple choice questions. The candidates are required to answer the questions as per the instructions given in the OMR sheet.

AR/AXR-15-MTH/OS-07-MT-I



ସମୟ : 1 ଘଣ୍ଟା 15 ମିନିଟ୍  
Time : 1 Hour 15 Minutes

ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା : 50  
Full Marks : 50

$\pi$  ର ମୂଲ୍ୟ  $\frac{22}{7}$  ନିଅ (Take  $\pi$  as  $\frac{22}{7}$ )

ଏହି ବିଭାଗରେ 50ଟି ପ୍ରଶ୍ନ ଦିଆଯାଇଛି । ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନ ପାଇଁ ଚାରୋଟି ବିକଳ୍ପ ଉତ୍ତର ଦିଆଯାଇଛି । ସେଥି ମଧ୍ୟରୁ ଠିକ୍ ଉତ୍ତରଟି ବାଛି OMR ଉତ୍ତର ଫର୍ମରେ ଥିବା ସଂପୃକ୍ତ ବୃତ୍ତଟିକୁ ନୀଳ/କଳା ବଲ୍‌ପଏଣ୍ଟ କଲମ ଦ୍ୱାରା ସମ୍ପୂର୍ଣ୍ଣଭାବେ ନୀଳ/କଳା କର ।

In this Part 50 questions are given. Each question has four alternative answers. Choose the correct answer from them and darken the appropriate circle completely in the OMR sheet with the Blue/Black ball point pen.

ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନର ମୂଲ୍ୟ 1 (ଏକ) ନମ୍ବର ।

Each question carries 1 (one) mark.

ସମସ୍ତ ପ୍ରଶ୍ନର ଉତ୍ତର ଦିଅ ।

Answer all questions.

- |   |  |
|---|--|
| <p>1. ପ୍ରଥମ 5 ଟ ମୌଳିକ ସଂଖ୍ୟାର ମଧ୍ୟମା, ପ୍ରଥମ 6 ଟ ମୌଳିକ ସଂଖ୍ୟାର ମଧ୍ୟମାଠାରୁ କେତେ କମ୍ ?</p> <p>(A) 2 (B) 0.5<br/>(C) 1 (D) 1.5</p>              | <p>1. How much less is the median of the first 5 prime numbers than the median of the first 6 prime numbers ?</p> <p>(A) 2 (B) 0.5<br/>(C) 1 (D) 1.5</p> |
| <p>2. <math>x, x+2, x+4, x+6, x+8</math> ଓ <math>x+10</math> ର ମାଧ୍ୟମା 8 ହେଲେ, <math>x</math> କେତେ ?</p> <p>(A) 4 (B) 1<br/>(C) 2 (D) 3</p> | <p>2. If the mean of <math>x, x+2, x+4, x+6, x+8</math> and <math>x+10</math> is 8, then what is <math>x</math> ?</p> <p>(A) 4 (B) 1<br/>(C) 2 (D) 3</p> |
| <p>3. 5, 6, 7, 7, 8, 8, 9, 9, 9, 9, 10, 11, 12, 12 ର ଗରିଷ୍ଠକ କେତେ ?</p> <p>(A) 11 (B) 8<br/>(C) 9 (D) 10</p>                                | <p>3. What is the mode of 5, 6, 7, 7, 8, 8, 9, 9, 9, 9, 10, 11, 12, 12 ?</p> <p>(A) 11 (B) 8<br/>(C) 9 (D) 10</p>  |

ରଖିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

4. (5, -3), (5, 4) ଏବଂ (x, 0) ବିନ୍ଦୁତ୍ରୟ ଏକରେଖୀ ହେଲେ, x ର ମାନ କେତେ ?
- (A) 5 (B) -3  
(C) 4 (D) 0
5. (1, -2) ଓ (-3, -5) ବିନ୍ଦୁଦ୍ୱୟ ମଧ୍ୟରେ ଦୂରତା କେତେ ?
- (A) 5 (B) 2  
(C) 3 (D) 4
6. (1, 5) ଓ (7, 2) ବିନ୍ଦୁଦ୍ୱୟର ସଂଯୋଜକ ରେଖାଖଣ୍ଡକୁ 1 : 2 ଅନୁପାତରେ ଅନ୍ତର୍ବିଭାଜନ କରୁଥିବା ବିନ୍ଦୁର ସ୍ଥାନାଙ୍କ କେତେ ?
- (A) (5, 2)  
(B) (3, 4)  
(C) (4, 3)  
(D) (2, 5)
7. ଦୁଇଟି ମୁଦ୍ରାକୁ ଏକ ସଙ୍ଗେ ଟସ୍ କଲେ, ଅତିକମ୍ରେ ଗୋଟିଏ T ଆସିବାର ସମ୍ଭାବ୍ୟତା କେତେ ?
- (A)  $\frac{3}{4}$   
(B)  $\frac{1}{3}$   
(C)  $\frac{2}{3}$   
(D)  $\frac{1}{4}$

4. If the three points (5, -3), (5, 4) and (x, 0) lie in one line, then what is the value of x ?
- (A) 5 (B) -3  
(C) 4 (D) 0
5. What is the distance between the two points (1, -2) and (-3, -5) ?
- (A) 5 (B) 2  
(C) 3 (D) 4
6. What are the co-ordinates of the point that divides the line segment joining the points (1, 5) and (7, 2) internally in the ratio 1 : 2 ?
- (A) (5, 2)  
(B) (3, 4)  
(C) (4, 3)  
(D) (2, 5)
7. If two coins are tossed simultaneously, what is the probability of getting at least one T ?
- (A)  $\frac{3}{4}$   
(B)  $\frac{1}{3}$   
(C)  $\frac{2}{3}$   
(D)  $\frac{1}{4}$

ରଫ୍ କରିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

8. ଦୁଇଟି ଲୁଡୁଗୋଟିକୁ ଥରେ ଗଢ଼ାଇଲେ, ଗୋଟି ଦୁଇଟିରେ ପଢ଼ିଥିବା ସଂଖ୍ୟାଦୁଇଟିର ସମଷ୍ଟି 9 ହେବାର ସମ୍ଭାବ୍ୟତା କେତେ ?

- (A)  $\frac{1}{9}$   
 (B)  $\frac{1}{5}$   
 (C)  $\frac{1}{6}$   
 (D)  $\frac{1}{8}$

9. ସହ ସମୀକରଣ  $x + y = 2$  ଓ  $x - y = 0$  ଲେଖଦ୍ୱାରା ଛେଦବିନ୍ଦୁର ସ୍ଥାନାଙ୍କ କେତେ ?

- (A) (1, -1)  
 (B) (2, 0)  
 (C) (0, 2)  
 (D) (1, 1)

10. ଡିଟରମିନାଣ୍ଟ  $\begin{vmatrix} a & c \\ b & d \end{vmatrix}$  ର ମୂଲ୍ୟ କେତେ ?

- (A)  $ad + bc$   
 (B)  $ab - cd$   
 (C)  $ad - bc$   
 (D)  $ab + cd$

8. If two ludo-dice are thrown once, then what is the probability of getting 9 as the sum of the two numbers shown by both the dice ?

- (A)  $\frac{1}{9}$   
 (B)  $\frac{1}{5}$   
 (C)  $\frac{1}{6}$   
 (D)  $\frac{1}{8}$

9. What are the co-ordinates of the point of intersection of the graphs of the simultaneous equations  $x + y = 2$  and  $x - y = 0$  ?

- (A) (1, -1)  
 (B) (2, 0)  
 (C) (0, 2)  
 (D) (1, 1)

10. What is the value of the determinant

$$\begin{vmatrix} a & c \\ b & d \end{vmatrix} ?$$

- (A)  $ad + bc$   
 (B)  $ab - cd$   
 (C)  $ad - bc$   
 (D)  $ab + cd$

ରଫ୍ କରିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

11. କେଉଁ ସହ-ସମୀକରଣ ଯୋଡ଼ିର ଅନନ୍ୟ ସମାଧାନ ସମ୍ଭବ ?

- (A)  $2x - y + 3 = 0, -4x + 2y - 6 = 0$   
 (B)  $x + y + 1 = 0, x - y + 1 = 0$   
 (C)  $x + y + 2 = 0, x + y + 3 = 0$   
 (D)  $2x - y + 3 = 0, -6x + 3y + 5 = 0$

12. ABCD ଆୟତଚିତ୍ରର  $AB = (3x + y)$  ସେ.ମି.,  $BC = (3x + 2)$  ସେ.ମି.,  $CD = (3y - 2x)$  ସେ.ମି. ଓ  $DA = (y + 3)$  ସେ.ମି. । ଏହାର ପ୍ରତି ବାହୁର ଦୈର୍ଘ୍ୟ ନିର୍ଣ୍ଣୟ କରିବା ପାଇଁ ଆବଶ୍ୟକ ସହ-ସମୀକରଣ ଦୁଇଟି କିଏ ?

- (A) ଏ ସମସ୍ତ  
 (B)  $3x + y = 3y - 2x, 3x + 2 = y + 3$   
 (C)  $3x + y = 3x + 2, 3y - 2x = y + 3$   
 (D)  $3x + y = y + 3, 3x + 2 = 3y - 2x$

13. ନିମ୍ନ କେଉଁ ବିନ୍ଦୁଟି  $3x - y = 1$  ସମୀକରଣର ଲେଖ ଉପରେ ଅବସ୍ଥିତ ନୁହେଁ ?

- (A) (2, 5) (B) (0, -1)  
 (C) (0, 1) (D) (1, 2)

14. ଯଦି  $a \neq 0$  ହୁଏ, ନିମ୍ନ ମଧ୍ୟରୁ କେଉଁଟି  $x$  ର ଏକ ଦ୍ଵିଘାତ ସମୀକରଣ ?

- (A)  $ax + \frac{b}{x} + c = 0$   
 (B)  $ax + \frac{b}{x} = 2x^2$   
 (C)  $x(ax - 1)(bx - 2) = 6$   
 (D)  $ax^2 + \frac{b}{x^2} = 2$

11. Which pair of the simultaneous equations, have unique solution ?

- (A)  $2x - y + 3 = 0, -4x + 2y - 6 = 0$   
 (B)  $x + y + 1 = 0, x - y + 1 = 0$   
 (C)  $x + y + 2 = 0, x + y + 3 = 0$   
 (D)  $2x - y + 3 = 0, -6x + 3y + 5 = 0$

12. In the rectangle ABCD,  $AB = (3x + y)$  cm,  $BC = (3x + 2)$  cm,  $CD = (3y - 2x)$  cm and  $DA = (y + 3)$  cm. What is the pair of simultaneous equations required to determine the length of each of the sides of the rectangle ABCD ?

- (A) All of these  
 (B)  $3x + y = 3y - 2x, 3x + 2 = y + 3$   
 (C)  $3x + y = 3x + 2, 3y - 2x = y + 3$   
 (D)  $3x + y = y + 3, 3x + 2 = 3y - 2x$

13. Which of the following points does **not** lie on the graph of the equation  $3x - y = 1$  ?

- (A) (2, 5) (B) (0, -1)  
 (C) (0, 1) (D) (1, 2)

14. If  $a \neq 0$ , then which one of the following is a quadratic equation in  $x$  ?

- (A)  $ax + \frac{b}{x} + c = 0$   
 (B)  $ax + \frac{b}{x} = 2x^2$   
 (C)  $x(ax - 1)(bx - 2) = 6$   
 (D)  $ax^2 + \frac{b}{x^2} = 2$

ରଖି କରିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

15.  $4x^2 + kx + 3 = 0$  ସମୀକରଣର ମୂଳଦ୍ୱୟ ବାସ୍ତବ ଓ ସମାନ ହେଲେ,  $k$  ର ମାନ କେତେ ?

- (A)  $\pm \frac{3}{4}$  (B)  $\pm \frac{4}{\sqrt{3}}$   
(C)  $\pm 4\sqrt{3}$  (D)  $\pm \frac{4}{3}$

16.  $\sqrt{x} + x - 6 = 0$  କୁ ଏକ ଦ୍ୱିଘାତ ସମୀକରଣରେ ପ୍ରକାଶ କଲେ, କେତେ ହେବ ?

- (A)  $x^2 - 12x + 36 = 0$   
(B)  $x^2 - 13x + 36 = 0$   
(C)  $x^2 + 13x + 36 = 0$   
(D)  $x^2 + 12x + 36 = 0$

17.  $x^2 + 3x + 4 = 0$  ସମୀକରଣର ମୂଳଦ୍ୱୟ  $\alpha$  ଓ  $\beta$  ହେଲେ,  $\alpha^2 + \beta^2$  ର ମାନ କେତେ ?

- (A) 0 (B) -1  
(C) 2 (D) 1

18.  $x$  ଓ 7 ମଧ୍ୟବର୍ତ୍ତୀ ସମାନ୍ତର ମଧ୍ୟକର୍ତ୍ତୀ 9 ହେଲେ,  $x$  କେତେ ହେବ ?

- (A) 12 (B) 9  
(C) 10 (D) 11

19. ଏକ ସମାନ୍ତର ପ୍ରଗତିରେ  $t_n = 2n - 1$ , ହେଲେ,  $S_n$  କେତେ ହେବ ?

- (A)  $n^2$  (B)  $\frac{n(n+1)}{2}$   
(C)  $n^2 - 1$  (D)  $n^2 + 1$

15. The roots of the equation  $4x^2 + kx + 3 = 0$  are real and equal. What is the value of  $k$  ?

- (A)  $\pm \frac{3}{4}$  (B)  $\pm \frac{4}{\sqrt{3}}$   
(C)  $\pm 4\sqrt{3}$  (D)  $\pm \frac{4}{3}$

16. If  $\sqrt{x} + x - 6 = 0$  is expressed as a quadratic equation, then what will it be ?

- (A)  $x^2 - 12x + 36 = 0$   
(B)  $x^2 - 13x + 36 = 0$   
(C)  $x^2 + 13x + 36 = 0$   
(D)  $x^2 + 12x + 36 = 0$

17. If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 + 3x + 4 = 0$ , then what is the value of  $\alpha^2 + \beta^2$  ?

- (A) 0 (B) -1  
(C) 2 (D) 1

18. If the arithmetic mean between  $x$  and 7 is 9, then what is  $x$  ?

- (A) 12 (B) 9  
(C) 10 (D) 11

19. In an arithmetic progression, if  $t_n = 2n - 1$ , then what is  $S_n$  ?

- (A)  $n^2$  (B)  $\frac{n(n+1)}{2}$   
(C)  $n^2 - 1$  (D)  $n^2 + 1$

ରଖି କରିବା ସ୍ଥାନ / SPACE FOR ROUGH WORK

20. ଏକ A.P.ର ପ୍ରଥମ ପଦ 100 ଓ ସାଧାରଣ ଅନ୍ତର  $-1$  ହେଲେ, 100 ଡମ ପଦଟି କେତେ ?  
 (A)  $-2$  (B)  $-1$   
 (C) 1 (D) 2
21. ଗୋଟିଏ A.P.ର  $t_7 = 20$  ଓ  $t_{18} = 42$  ହେଲେ, ସାଧାରଣ ଅନ୍ତର  $d$  କେତେ ?  
 (A) 8 (B) 2  
 (C) 3 (D) 4
22. ଗୋଟିଏ ଲୁଡୁ ଗୋଟିକୁ ଥରେ ଗଢ଼ାଇଲେ, ଫଳ 5 ବା ତାଠାରୁ କମ୍ ହେବାର ସମ୍ଭାବ୍ୟତା କେତେ ?  
 (A)  $\frac{6}{6}$  (B)  $\frac{2}{3}$   
 (C)  $\frac{3}{6}$  (D)  $\frac{5}{6}$
23. ଗୋଟିଏ ଲୁଡୁଗୋଟିକୁ ଥରେ ଗଢ଼ାଇ ମୌଳିକ ବା ଯୌଗିକ ହୋଇ ନ ଥିବା ସଂଖ୍ୟା ପାଇବାର ସମ୍ଭାବ୍ୟତା କେତେ ?  
 (A) 0 (B)  $\frac{1}{6}$   
 (C)  $\frac{2}{6}$  (D)  $\frac{3}{6}$
24. 5, 8, 3, 7, 11, 27 ଏବଂ 16 ଏହି ଲବ୍ଧାଙ୍କ ଗୁଡ଼ିକର ମଧ୍ୟମା କେତେ ?  
 (A) 7 (B) 10  
 (C) 9 (D) 8
25. 60 ରୁ କମ୍ ହୋଇଥିବା 9 ର ସମସ୍ତ ଗୁଣିତକ ମାନଙ୍କର ମଧ୍ୟମା କେତେ ?  
 (A) 31.5 (B) 27.5  
 (C) 29 (D) 30

20. In an A.P., the first term is 100 and common difference is  $-1$ . Then what is the 100<sup>th</sup> term ?  
 (A)  $-2$  (B)  $-1$   
 (C) 1 (D) 2
21. In an A.P.,  $t_7 = 20$  and  $t_{18} = 42$ . Then what is the common difference ?  
 (A) 8 (B) 2  
 (C) 3 (D) 4
22. If a ludo-die is rolled once, then what is the probability of getting 5 or less than that ?  
 (A)  $\frac{6}{6}$  (B)  $\frac{2}{3}$   
 (C)  $\frac{3}{6}$  (D)  $\frac{5}{6}$
23. When a ludo-die is thrown once, what is the probability of getting the number which is neither prime nor composite ?  
 (A) 0 (B)  $\frac{1}{6}$   
 (C)  $\frac{2}{6}$  (D)  $\frac{3}{6}$
24. What is the median of the scores 5, 8, 3, 7, 11, 27, and 16 ?  
 (A) 7 (B) 10  
 (C) 9 (D) 8
25. What is the median of all multiples of 9 below 60 ?  
 (A) 31.5 (B) 27.5  
 (C) 29 (D) 30

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26. ଦୁଇଟି ଏକ କେନ୍ଦ୍ରିକ ବୃତ୍ତ ମଧ୍ୟରୁ ବଡ଼ ବୃତ୍ତର ଏକ ଜ୍ୟା  $\overline{AB}$  ସାନ ବୃତ୍ତକୁ P ବିନ୍ଦୁରେ ସ୍ପର୍ଶ କରେ । ବୃତ୍ତ ଦ୍ଵୟର ବ୍ୟାସାର୍ଦ୍ଧ 10 ସେ.ମି. ଓ 6 ସେ.ମି. ହେଲେ,  $\overline{AB}$  ର ଦୈର୍ଘ୍ୟ କେତେ ସେ.ମି. ?  
 (A) 24 (B) 8  
 (C) 16 (D) 20
27.  $\sin 15^\circ + \cos 105^\circ$  ର ମାନ କେତେ ?  
 (A)  $\frac{\sqrt{3}}{2}$  (B) -1  
 (C) 0 (D)  $\frac{1}{2}$
28.  $\cot 12^\circ \cdot \cot 38^\circ \cdot \cot 45^\circ \cdot \cot 52^\circ \cdot \cot 78^\circ$  ର ମାନ କେତେ ?  
 (A)  $\frac{1}{\sqrt{3}}$  (B) 1  
 (C)  $\sqrt{3}$  (D)  $\frac{1}{\sqrt{2}}$
29.  $\operatorname{cosec}^2(140^\circ + \alpha) - \cot^2(40^\circ - \alpha)$  ର ମାନ କେତେ ?  
 (A)  $\sqrt{2}$  (B) -1  
 (C) 0 (D) 1
30.  $\frac{\cot 32^\circ \cdot \cot 13^\circ - 1}{\cot 13^\circ + \cot 32^\circ}$  ର ମାନ କେତେ ?  
 (A)  $\frac{1}{\sqrt{2}}$  (B) 0  
 (C) 1 (D) -1
31.  $\sin(30^\circ + A) + \sin(30^\circ - A)$  ର ମୂଲ୍ୟ କେତେ ?  
 (A)  $\cos 30^\circ$  (B)  $\sin A$   
 (C)  $\cos A$  (D)  $\sin 30^\circ$

26. In two concentric circles, a chord  $\overline{AB}$  of the bigger circle touches the smaller circle at the point P. If the radii of two circles are 10 cm and 6 cm, then what is the length of  $\overline{AB}$  in cm ?  
 (A) 24 (B) 8  
 (C) 16 (D) 20
27. What is the value of  $\sin 15^\circ + \cos 105^\circ$  ?  
 (A)  $\frac{\sqrt{3}}{2}$  (B) -1  
 (C) 0 (D)  $\frac{1}{2}$
28. What is the value of  $\cot 12^\circ \cdot \cot 38^\circ \cdot \cot 45^\circ \cdot \cot 52^\circ \cdot \cot 78^\circ$  ?  
 (A)  $\frac{1}{\sqrt{3}}$  (B) 1  
 (C)  $\sqrt{3}$  (D)  $\frac{1}{\sqrt{2}}$
29. What is the value of  $\operatorname{cosec}^2(140^\circ + \alpha) - \cot^2(40^\circ - \alpha)$  ?  
 (A)  $\sqrt{2}$  (B) -1  
 (C) 0 (D) 1
30. What is the value of  $\frac{\cot 32^\circ \cdot \cot 13^\circ - 1}{\cot 13^\circ + \cot 32^\circ}$  ?  
 (A)  $\frac{1}{\sqrt{2}}$  (B) 0  
 (C) 1 (D) -1
31. What is the value of  $\sin(30^\circ + A) + \sin(30^\circ - A)$  ?  
 (A)  $\cos 30^\circ$  (B)  $\sin A$   
 (C)  $\cos A$  (D)  $\sin 30^\circ$

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32. 9 ସେ.ମି. ବ୍ୟାସାର୍ଦ୍ଧ ବିଶିଷ୍ଟ ଗୋଟିଏ ନିଦା ଧାତବ ଗୋଲକକୁ ତରଳାଇ 3 ସେ.ମି. ବ୍ୟାସାର୍ଦ୍ଧ ବିଶିଷ୍ଟ ନିଦା ଗୋଲକରେ ପରିଣତ କଲେ, ସର୍ବାଧିକ କେତୋଟି ଗୋଲକ ମିଳିବ ?

- (A) 27 (B) 3  
(C) 9 (D) 18

33. ଗୋଟିଏ ବୃତ୍ତକଳାର ବ୍ୟାସାର୍ଦ୍ଧ 7 ସେ.ମି. ଓ କେନ୍ଦ୍ରୀୟ କୋଣର ପରିମାଣ  $\frac{2}{7}$  ରେଡିଆନ ହେଲେ, ଏହାର କ୍ଷେତ୍ରଫଳ କେତେ ବର୍ଗ ସେ.ମି. ହେବ ?

- (A) 49 (B) 7  
(C) 14 (D) 35

34. ଗୋଟିଏ ସିଲିଣ୍ଡରର ଉଚ୍ଚତା ଏହାର ଭୂମିର ବ୍ୟାସର ଦୁଇଗୁଣ ଏବଂ ଏହାର ଆୟତନ 539 ଘନ ସେ.ମି. । ସିଲିଣ୍ଡରର ଭୂମିର ବ୍ୟାସ କେତେ ସେ.ମି. ?

- (A) 3.5 (B) 14  
(C) 10.5 (D) 7

35. 10 ସେ.ମି. ଉଚ୍ଚତା ବିଶିଷ୍ଟ ଗୋଟିଏ ସରଳ ପ୍ରିଜମର ଭୂମି ଏକ ସମବାହୁ ତ୍ରିଭୁଜ । ଭୂମିର କ୍ଷେତ୍ରଫଳ  $16\sqrt{3}$  ବର୍ଗ ସେ.ମି. । ପ୍ରିଜମର ପାର୍ଶ୍ଵପୃଷ୍ଠର କ୍ଷେତ୍ରଫଳ କେତେ ବର୍ଗ ସେ.ମି. ?

- (A) 80 (B) 480  
(C) 240 (D)  $160\sqrt{3}$

32. What is the maximum number of solid spheres of radius 3 cm that can be made by melting and recasting a solid metallic sphere of radius 9 cm ?

- (A) 27 (B) 3  
(C) 9 (D) 18

33. The central angle of a sector of a circle is  $\frac{2}{7}$  radian and its radius is 7 cm. What is its area in sq. cm ?

- (A) 49 (B) 7  
(C) 14 (D) 35

34. The height of a cylinder is double of its diameter and its volume is 539 cu. cm. What is the diameter of its base in cm ?

- (A) 3.5 (B) 14  
(C) 10.5 (D) 7

35. The base of a right prism of height 10 cm is an equilateral triangle. The base area of it is  $16\sqrt{3}$  sq. cm. What is the lateral surface area of the prism in sq. cm ?

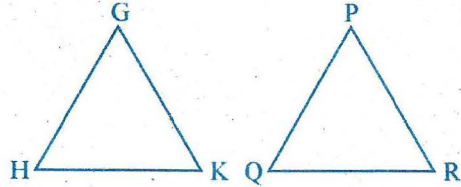
- (A) 80 (B) 480  
(C) 240 (D)  $160\sqrt{3}$

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SET : **C**

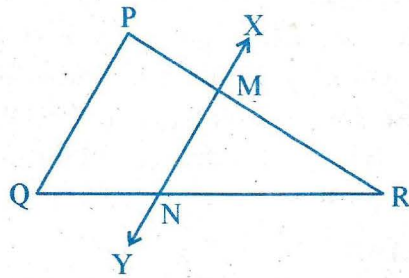
AR/AXR-15-MTH/OS-07-MT-I

36. ଦତ୍ତ ଚିତ୍ରରେ,  $\Delta GHK \sim \Delta PQR$  । ନିମ୍ନଲିଖିତ କେଉଁ ଅନୁପାତଟି  $GH : PQ$  ସହ ସମାନ ନୁହେଁ ?



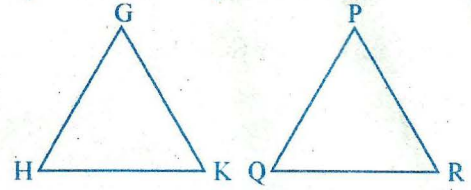
- (A)  $\Delta GHK$  ର ପରିସୀମା :  $\Delta PQR$  ର ପରିସୀମା  
 (B)  $\overline{HK}$  ପ୍ରତି ମଧ୍ୟମାର ଦୈର୍ଘ୍ୟ :  $\overline{QR}$  ପ୍ରତି ମଧ୍ୟମାର ଦୈର୍ଘ୍ୟ  
 (C)  $\Delta GHK$  ର  $\angle H$  ର ସମଦ୍ୱିଖଣ୍ଡକର ଦୈର୍ଘ୍ୟ :  $\Delta PQR$  ର  $\angle Q$  ର ସମଦ୍ୱିଖଣ୍ଡକର ଦୈର୍ଘ୍ୟ  
 (D)  $\overline{GK}$  ପ୍ରତି  $\Delta GHK$  ର ଉଚ୍ଚତା :  $\overline{PQ}$  ପ୍ରତି  $\Delta PQR$  ର ଉଚ୍ଚତା

37. ଦତ୍ତ ଚିତ୍ରରେ ଥିବା  $\Delta PQR$  ରେ,  $\overleftrightarrow{XY} \parallel \overleftrightarrow{PQ}$  ।  $PM : PR = 2 : 5$  ଏବଂ  $QN = 4$  ସେ.ମି. ହେଲେ,  $NR$  କେତେ ସେ.ମି. ?



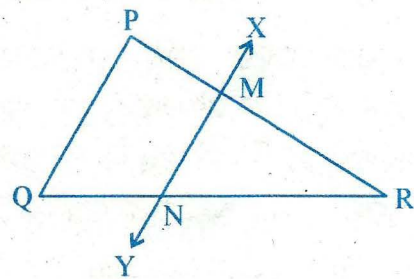
- (A) 5                      (B) 10  
 (C) 8                      (D) 6

36. In the given figure,  $\Delta GHK \sim \Delta PQR$ ; which of the following ratios is **not** equal to  $GH : PQ$  ?



- (A) Perimeter of  $\Delta GHK$  : perimeter of  $\Delta PQR$   
 (B) Length of the median drawn to  $\overline{HK}$  : length of the median drawn to  $\overline{QR}$   
 (C) Length of the bisector of  $\angle H$  of  $\Delta GHK$  : length of the bisector of  $\angle Q$  of  $\Delta PQR$   
 (D) Height of  $\Delta GHK$  on  $\overline{GK}$  : height of  $\Delta PQR$  on  $\overline{PQ}$

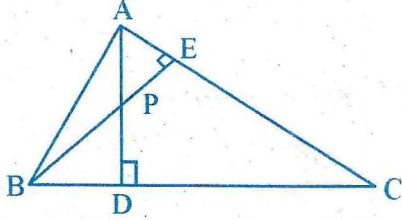
37. In  $\Delta PQR$  of the given figure,  $\overleftrightarrow{XY} \parallel \overleftrightarrow{PQ}$ . If  $PM : PR = 2 : 5$  and  $QN = 4$  cm, then how much is  $NR$  in cm ?



- (A) 5                      (B) 10  
 (C) 8                      (D) 6

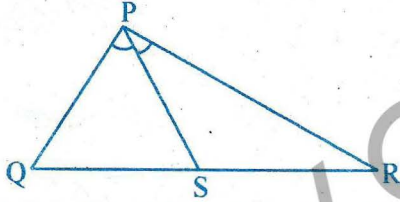
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38.  $\triangle ABC$  ରେ  $\overline{AD}$  ଓ  $\overline{BE}$  ଯଥାକ୍ରମେ  $\overline{BC}$  ଓ  $\overline{AC}$  ବାହୁମାନଙ୍କ ପ୍ରତି ଲମ୍ବ ଏବଂ  $\overline{AD}$  ଓ  $\overline{BE}$  ର ଛେଦବିନ୍ଦୁ P ହେଲେ,  $\triangle APE$  କେଉଁ ତ୍ରିଭୁଜ ସହ ସମଦୃଶ ?



- (A)  $\triangle BPD$  (B)  $\triangle BDA$   
(C)  $\triangle ABE$  (D)  $\triangle ADC$

39. ଦତ୍ତ ଚିତ୍ରରେ,  $\overline{PS}$ ,  $\angle QPR$  ର ସମଦ୍ୱିଖଣ୍ଡକ ଅଟେ ।  $\triangle PQS$  ଓ  $\triangle PSR$  ର କ୍ଷେତ୍ରଫଳର ଅନୁପାତ କେତେ ?

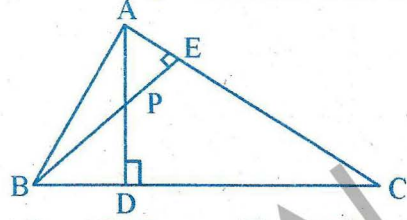


- (A)  $PQ : PR$  (B)  $PQ : SR$   
(C)  $QS : PR$  (D)  $PS : QR$

40.  $\triangle ABC \sim \triangle PQR$  ।  $\triangle ABC$  ର ପରିସୀମା 60 ସେ.ମି. ଓ କ୍ଷେତ୍ରଫଳ 81 ବର୍ଗ ସେ.ମି. ।  $\triangle PQR$  ର ପରିସୀମା 80 ସେ.ମି. ହେଲେ, କ୍ଷେତ୍ରଫଳ କେତେ ବର୍ଗ ସେ.ମି. ?

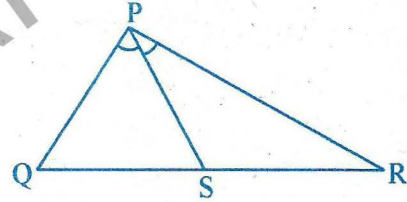
- (A) 144 (B) 96  
(C) 108 (D) 126

38. In  $\triangle ABC$ ,  $\overline{AD}$  and  $\overline{BE}$  are the perpendiculars to the sides  $\overline{BC}$  and  $\overline{AC}$  respectively. If P is the point of intersection of  $\overline{AD}$  and  $\overline{BE}$ , then which triangle is similar to  $\triangle APE$  ?



- (A)  $\triangle BPD$  (B)  $\triangle BDA$   
(C)  $\triangle ABE$  (D)  $\triangle ADC$

39. In the given figure,  $\overline{PS}$  is the bisector of  $\angle QPR$ . What is the ratio of the areas of  $\triangle PQS$  and  $\triangle PSR$  ?



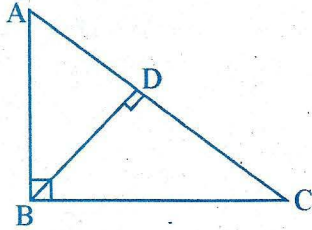
- (A)  $PQ : PR$  (B)  $PQ : SR$   
(C)  $QS : PR$  (D)  $PS : QR$

40.  $\triangle ABC \sim \triangle PQR$ . Perimeter  $\triangle ABC$  is 60 cm and its area is 81 sq. cm. If the perimeter of  $\triangle PQR$  is 80 cm, then what is its area in sq. cm ?

- (A) 144 (B) 96  
(C) 108 (D) 126

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41. ଦତ୍ତ ଚିତ୍ରରେ  $m\angle ABC = 90^\circ$ ,  $\overline{BD} \perp \overline{AC}$ ,  
 $BC = 12$  ସେ.ମି.,  $CD = 9$  ସେ.ମି.  
 ହେଲେ,  $AD$  କେତେ ସେ.ମି. ?



- (A)  $9\sqrt{2}$   
 (B)  $7\sqrt{2}$   
 (C) 7  
 (D) 9

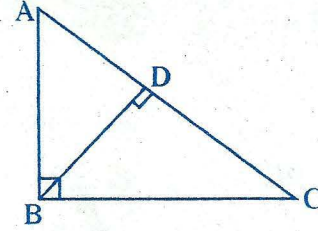
42. ଗୋଟିଏ ରେଖାଖଣ୍ଡ AB କୁ ଏକ ବ୍ୟାସାର୍ଦ୍ଧ ରୂପେ ନେଇ ସର୍ବାଧିକ କେତୋଟି ବୃତ୍ତ ଅଙ୍କନ କରାଯାଇପାରିବ ?

- (A) 4  
 (B) 1  
 (C) 2  
 (D) 3

43. ଗୋଟିଏ ବୃତ୍ତର ବ୍ୟାସ 26 ସେ.ମି. । ବୃତ୍ତର କେନ୍ଦ୍ରଠାରୁ ଏକ ଜ୍ୟାର ଦୂରତା 5 ସେ.ମି. ହେଲେ, ଉକ୍ତ ଜ୍ୟାର ଦୈର୍ଘ୍ୟ କେତେ ସେ.ମି. ?

- (A) 12  
 (B) 24  
 (C) 18  
 (D)  $\sqrt{651}$

41. In the given figure,  $m\angle ABC = 90^\circ$ ,  
 $\overline{BD} \perp \overline{AC}$ . If  $BC = 12$  cm,  $CD = 9$  cm,  
 then what is  $AD$  in cm ?



- (A)  $9\sqrt{2}$   
 (B)  $7\sqrt{2}$   
 (C) 7  
 (D) 9

42. In the maximum, how many circles can be drawn taking a line-segment AB as a radius ?

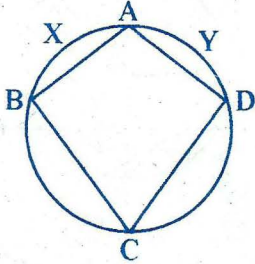
- (A) 4  
 (B) 1  
 (C) 2  
 (D) 3

43. The diameter of a circle is 26 cm. If the distance of a chord of the circle from its centre is 5 cm, then what is the length of the chord in cm ?

- (A) 12  
 (B) 24  
 (C) 18  
 (D)  $\sqrt{651}$

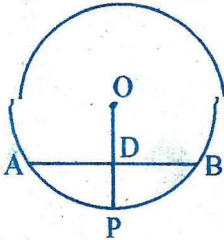
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44. ABCD ଏକ ବୃତ୍ତାନ୍ତର୍ଲିଖିତ ଚତୁର୍ଭୁଜ ଏବଂ X ଓ Y ଏହି ବୃତ୍ତ ଉପରିସ୍ଥ ଦୁଇଟି ବିନ୍ଦୁ ।  
 $m\widehat{BXA} = 55^\circ$  ଓ  $m\widehat{AYD} = 75^\circ$  ହେଲେ,  
 $m\angle BCD$  କେତେ ?



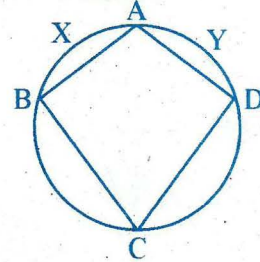
- (A)  $130^\circ$   
 (B)  $27\frac{1}{2}^\circ$   
 (C)  $37\frac{1}{2}^\circ$   
 (D)  $65^\circ$

45. ଦତ୍ତ ଚିତ୍ରରେ, ବୃତ୍ତ ABP ର କେନ୍ଦ୍ର O,  $\overline{AB}$  ଏକ ଜ୍ୟା ଏବଂ  $\overline{OP} \perp \overline{AB}$  ।  $\overline{OP}$  ଓ  $\overline{AB}$  ର ଛେଦ ବିନ୍ଦୁ D,  $AB = 16$  ସେ.ମି.,  $OD = 6$  ସେ.ମି. ହେଲେ,  $\overline{DP}$  କେତେ ସେ.ମି. ?



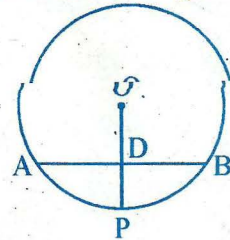
- (A) 10  
 (B) 4  
 (C) 6  
 (D) 8

44. ABCD is a cyclic quadrilateral and X, Y are two points on the circle. If  $m\widehat{BXA} = 55^\circ$  and  $m\widehat{AYD} = 75^\circ$ , then what is  $m\angle BCD$  ?



- (A)  $130^\circ$   
 (B)  $27\frac{1}{2}^\circ$   
 (C)  $37\frac{1}{2}^\circ$   
 (D)  $65^\circ$

45. In the given figure, O is the centre of the circle ABP and  $\overline{AB}$  is a chord.  $\overline{OP} \perp \overline{AB}$  and  $\overline{OP}$  intersects  $\overline{AB}$  at D. If  $AB = 16$  cm and  $OD = 6$  cm, then what is the length of  $\overline{DP}$  in cm ?

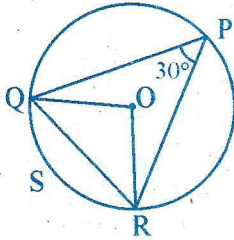


- (A) 10  
 (B) 4  
 (C) 6  
 (D) 8

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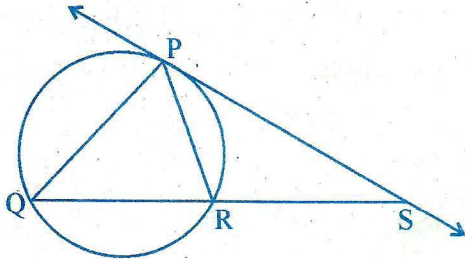
SET : **C**

46. ଦତ୍ତ ଚିତ୍ରରେ, PQR ବୃତ୍ତର କେନ୍ଦ୍ର O ଏବଂ S ହେଉଛି  $\widehat{QR}$  ର ଏକ ଅନ୍ତଃସ୍ଥ ବିନ୍ଦୁ ।  $m\angle QPR = 30^\circ$  ହେଲେ,  $m\widehat{QSR}$  କେତେ ?



- (A)  $75^\circ$       (B)  $30^\circ$   
 (C)  $45^\circ$       (D)  $60^\circ$

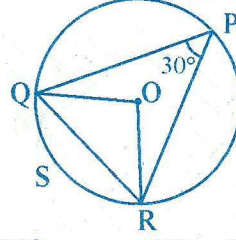
47. ଦତ୍ତ ଚିତ୍ରରେ PQR ବୃତ୍ତର P ବିନ୍ଦୁରେ  $\overleftrightarrow{PS}$  ସ୍ପର୍ଶକ ।  $\overleftrightarrow{PS}$  ଓ  $\overleftrightarrow{QR}$  ର ଛେଦବିନ୍ଦୁ S ହେଲେ,  $\frac{PR^2}{PQ^2}$  ସହ ନିମ୍ନସ୍ଥ କେଉଁଟି ସମାନ ?



- (A)  $\frac{QR^2}{QS^2}$   
 (B)  $\frac{RS}{QS}$   
 (C)  $\frac{QR}{QS}$   
 (D)  $\frac{RS^2}{QR^2}$

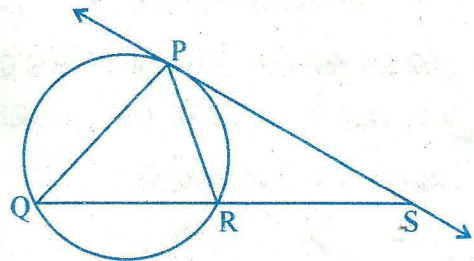
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46. In the given figure, O is the centre of the circle PQR and S is a point in the interior of  $\widehat{QR}$ . If  $m\angle QPR = 30^\circ$ , then what is  $m\widehat{QSR}$  ?



- (A)  $75^\circ$       (B)  $30^\circ$   
 (C)  $45^\circ$       (D)  $60^\circ$

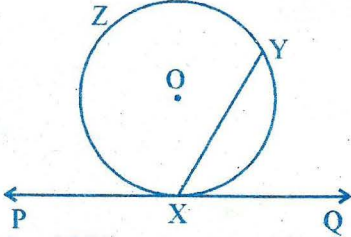
47. In the given figure,  $\overleftrightarrow{PS}$  is the tangent at P of the circle PQR. If  $\overleftrightarrow{QR}$  and  $\overleftrightarrow{PS}$  intersect at S, which of the following is equal to  $\frac{PR^2}{PQ^2}$  ?



- (A)  $\frac{QR^2}{QS^2}$   
 (B)  $\frac{RS}{QS}$   
 (C)  $\frac{QR}{QS}$   
 (D)  $\frac{RS^2}{QR^2}$

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48. ଦତ୍ତ ଚିତ୍ରରେ  $\overleftrightarrow{PQ}$  ହେଉଛି  $XYZ$  ବୃତ୍ତ ପ୍ରତି  $X$  ବିନ୍ଦୁରେ ସ୍ପର୍ଶକ ।  $m\widehat{XZY} = 220^\circ$  ହେଲେ,  $m\angle PXY$  କେତେ ?

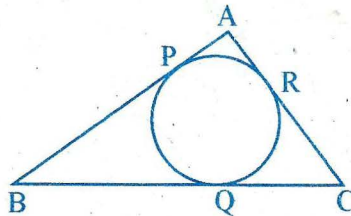


- (A)  $100^\circ$  (B)  $330^\circ$   
(C)  $220^\circ$  (D)  $110^\circ$

49. ଗୋଟିଏ ବୃତ୍ତର କେନ୍ଦ୍ରଠାରୁ ବୃତ୍ତର ବହିର୍ଗୁଣ ଏକ ବିନ୍ଦୁ P ର ଦୂରତା 10 ସେ.ମି. । P ଠାରୁ ବୃତ୍ତ ପ୍ରତି ଅଙ୍କିତ ସ୍ପର୍ଶକଖଣ୍ଡର ଦୈର୍ଘ୍ୟ 6 ସେ.ମି. ହେଲେ, ବୃତ୍ତର ବ୍ୟାସ କେତେ ସେ.ମି. ହେବ ?

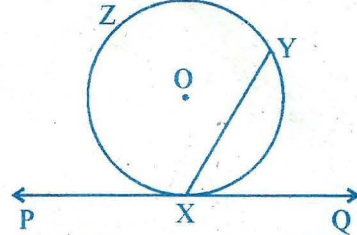
- (A) 16 (B) 6  
(C) 8 (D) 12

50. ଦତ୍ତଚିତ୍ରରେ  $\triangle ABC$  ର ଅନ୍ତଃବୃତ୍ତ PQR ।  $\triangle ABC$  ର  $\overline{AB}$ ,  $\overline{BC}$  ଓ  $\overline{AC}$  କୁ PQR ବୃତ୍ତ ଯଥାକ୍ରମେ P, Q ଓ R ବିନ୍ଦୁରେ ସ୍ପର୍ଶ କରେ ।  $BQ = 8$  ସେ.ମି.,  $CQ = 6$  ସେ.ମି. ଏବଂ  $\triangle ABC$  ର ପରିସୀମା 36 ସେ.ମି. ହେଲେ,  $\overline{AB}$  ର ଦୈର୍ଘ୍ୟ କେତେ ସେ.ମି. ?



- (A) 14 (B) 8  
(C) 10 (D) 12

48. In the given figure,  $\overleftrightarrow{PQ}$  is the tangent to the circle  $XYZ$  at  $X$ . If  $m\widehat{XZY} = 220^\circ$ , how much is  $m\angle PXY$  ?

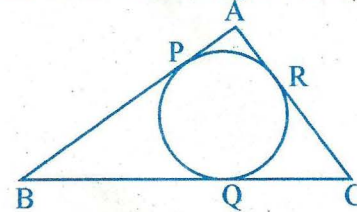


- (A)  $100^\circ$  (B)  $330^\circ$   
(C)  $220^\circ$  (D)  $110^\circ$

49. The distance of an external point P of a circle from its centre 10 cm and the length of the tangent-segment drawn from P to the circle is 6 cm. What is the length of the diameter in cm ?

- (A) 16 (B) 6  
(C) 8 (D) 12

50. In the given figure, PQR is the incircle of  $\triangle ABC$  and  $\overline{AB}$ ,  $\overline{BC}$  and  $\overline{AC}$  touch the circle at P, Q and R respectively. If  $BQ = 8$  cm,  $CQ = 6$  cm and the perimeter of  $\triangle ABC$  is 36 cm, then what is the length of  $\overline{AB}$  in cm ?



- (A) 14 (B) 8  
(C) 10 (D) 12

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