1994 HKCEE MATHS Paper II

1 If $f(x)=x^2+2x$, then $f(x-1)=$

A. x^2

B. x^2-1

C. x^2+2x-1

D. x^2+2x-3

E. x^2+4x-1

2 If $y=\dfrac{2x-1}{x+2}$, then $x=$

A. $\dfrac{1+3y}{2}$

B. $\dfrac{1+2y}{2+y}$

C. $\dfrac{1+2y}{2-y}$

D. $\dfrac{1-2y}{2+y}$

E. $\dfrac{1-2y}{2-y}$

3 The L.C.M. of $(x-1)^2$, x^2-1 and x^3-1 is

A. $x-1$

B. $(x-1)^4(x+1)(x^2+x+1)$

C. $(x-1)^2(x+1)(x^2+x+1)$

D. $(x-1)^2(x+1)(x^2-x+1)$

E. $(x-1)(x+1)(x^2+x+1)$

4 If $a=\sqrt{3}+\sqrt{2}$, then $a-\dfrac{1}{a}=$

A. 0

B. $2\sqrt{2}$

C. $2\sqrt{3}$

D. $\sqrt{3}-\sqrt{2}$

E. $\dfrac{2\sqrt{3}}{3}+\dfrac{\sqrt{2}}{2}$

5 In the figure, $(x, y)$is a point in the shaded region (including the boundary) and x, y are integers. Find the greatest value of $3x+y$.

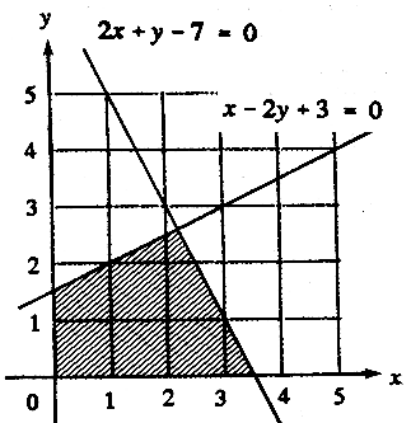
A. 7

B. 8

C. 9.2

D. 10

E. 10.5



6 If $x(x+1)<5(x+1)$, then

A. $x<5$

B. $x<-5$ or $x>1$

C. $x<-1$ or $x>5$

D. $-5<x<1$

E. $-1<x<5$

7 Which of the following is/are an identity /identities ?

I. $(x+2)(x-2)=x^2-4$

II. $(x+2)(x-2)=0$

III. $(x+2)^3=x^3+8$

A. I only

B. II only

C. III only

D. I and III only

E. II and III only

8 If $\alpha\neq\beta$ and $\begin{cases}3\alpha^2-h\alpha-b=0\\3\beta^2-h\beta-b=0\end{cases}$, then $\alpha+\beta=$

A. $-\dfrac{b}{3}$

B. $\dfrac{b}{3}$

C. h

D. $-\dfrac{h}{3}$

E. $\dfrac{h}{3}$

9 Mr. Chan bought a car for \$143 900. If the value of the car goes down by 10% each year, find its value at the end of the third year. (Give your answer correct to the nearest hundred dollars.)

A. \$94 400

B. \$100 700

C. \$104 900

D. \$115 100

E. \$116 600

10 A wholesaler sells an article to a retailer at a profit of 20%. The retailer sells it to a customer for \$3 600 at a profit of \$720. Find the original cost of the article to the wholesaler.

A. \$2 304
B. \$2 400
C. \$2 880
D. \$3 000
E. \$3 456

11 The bearing of A from B is 075°. What is the bearing of B from A ?

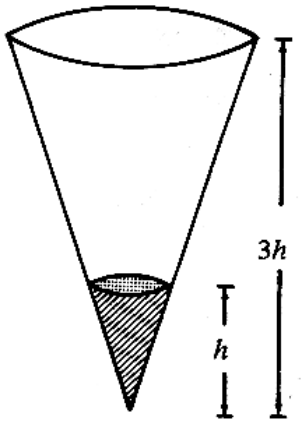
A. 015°
B. 075°
C. 105°
D. 195°
E. 255°

12 If the sum to infinity of a G.S. is $\frac{81}{4}$ and its second term is –9, the common ratio is

A. $-\frac{1}{3}$
B. $\frac{1}{3}$
C. $-\frac{4}{3}$
D. $\frac{4}{3}$
E. $-\frac{4}{9}$

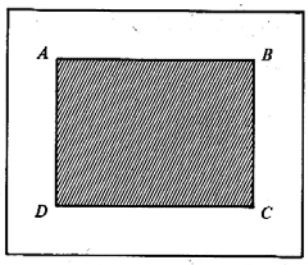
13 In the figure, the paper cup in the form of a circular cone contains 10ml of water. How many ml of water must be added to fill up the paper cup ?

A. 20
B. 80
C. 90
D. 260
E. 270



14 In the figure, $ABCD$ is a rectangular field of length p metres and width q metres. The path around the field is of width 2 metres. Find the area of the path.

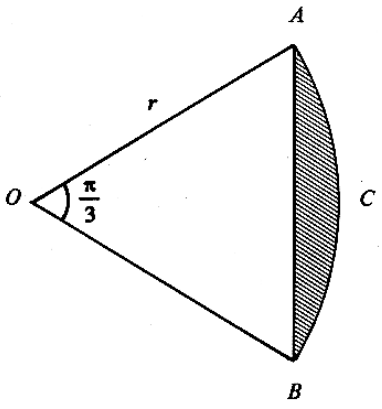
A. $(4p+4q)\text{m}^2$
B. $(2p+2q+4)\text{m}^2$
C. $(2p+2q+16)\text{m}^2$
D. $(4p+4q+16)\text{m}^2$
E. $(pq+4p+4q+16)\text{m}^2$



15 In the figure, $OACB$ is a sector of radius r.

If $\angle AOB=\frac{\pi}{3}$, find the area of the shaded part.

A. $\left(\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right)r^2$
B. $\left(\frac{\pi}{6}-\frac{1}{4}\right)r^2$
C. $\left(\frac{\pi}{3}-\frac{\sqrt{3}}{2}\right)r^2$



D. $\left(\frac{\pi}{3}-\frac{1}{2}\right)r^2$

E. $\frac{\pi}{3}r-\frac{\sqrt{3}}{4}r^2$

16 $\frac{\cos\theta}{\sin\theta+1}-\frac{\cos\theta}{\sin\theta-1}=$

A. $\frac{2}{\cos\theta}$

B. $-\frac{2}{\cos\theta}$

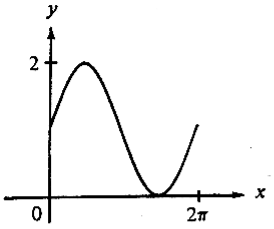
C. 0

D. $2\tan\theta$

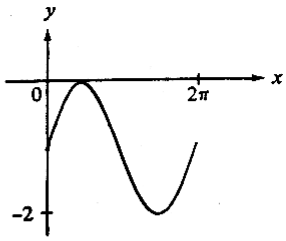
E. $-2\tan\theta$

17 Which of the following figures shows the graph of $y=1+\sin x$?

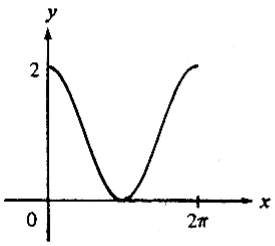
A.



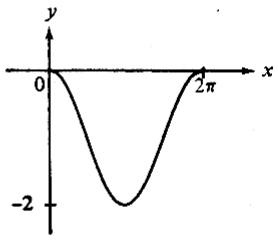
B.



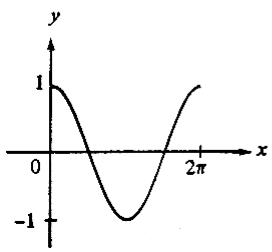
C.



D.



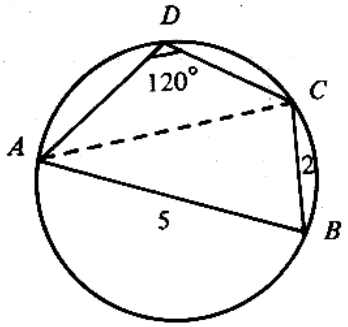
E.



18 $\frac{\sin(180°+\theta)}{\cos(90°-\theta)}=$

A. $\tan\theta$

19 In the figure, $ABCD$ is a cyclic quadrilateral with $AB=5$, $BC=2$ and $\angle ADC=120°$. Find AC.



A. $\sqrt{19}$

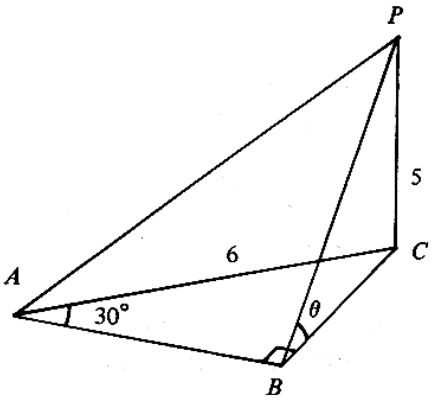
B. $\sqrt{21}$

C. $2\sqrt{6}$

D. $\sqrt{34}$

E. $\sqrt{39}$

20 In the figure, PC is a vertical pole standing on the horizontal plane ABC. If $\angle ABC=90°$, $\angle BAC=30°$, $AC=6$ and $PC=5$, find $\tan\theta$.



A. $\frac{3}{5}$

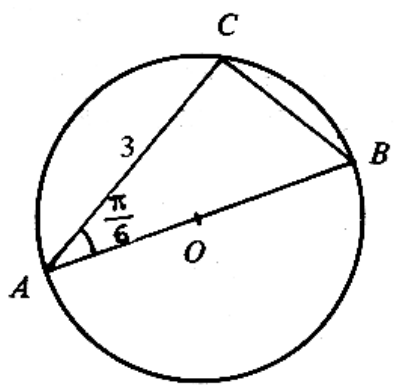
B. $\frac{5}{6}$

C. $\frac{5}{3}$

D. $\frac{3\sqrt{3}}{5}$

E. $\frac{5\sqrt{3}}{9}$

21 In the figure, O is the center of the circle. If $AC=3$ and $\angle BAC=\frac{\pi}{6}$, find the diameter AB.



A. $\frac{3}{2}$

B. 6

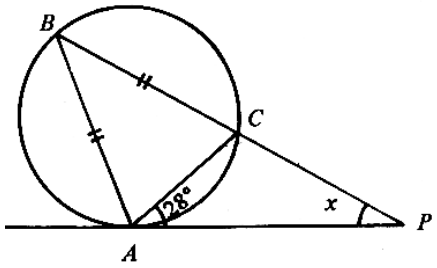
C. $\frac{3\sqrt{3}}{2}$

D. $2\sqrt{3}$

E. $3\sqrt{3}$

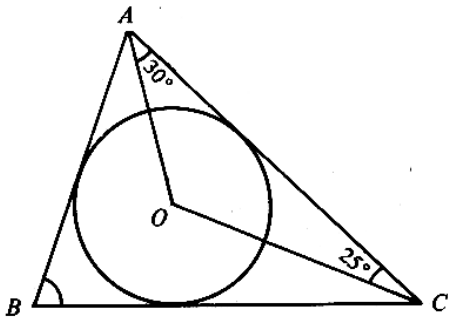
22 In the figure, PA is tangent to the circle at A, $\angle CAP=28^\circ$ and $BA=BC$. Find x.

A. 28°
B. 48°
C. 56°
D. 62°
E. 76°



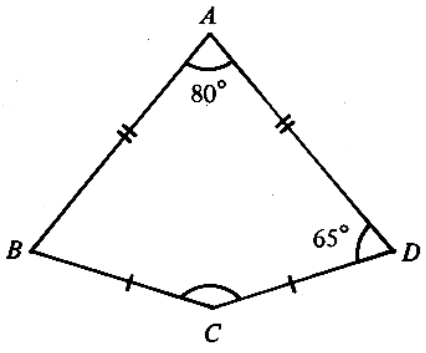
23 In the figure, O is the center of the inscribed circle of ΔABC. If $\angle OAC=30^\circ$ and $\angle OCA=25^\circ$, find $\angle ABC$.

A. 50°
B. 55°
C. 60°
D. 62.5°
E. 70°



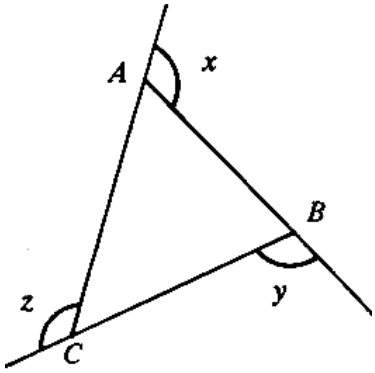
24 In the figure, $AB=AD$ and $BC=CD$. If $\angle BAD=80^\circ$ and $\angle ADC=65^\circ$, then $\angle BCD=$

A. 100°
B. 130°
C. 145°
D. 150°
E. 160°



25 In the figure, x , y and z are the exterior angles of ΔABC. If $x:y:z=4:5:6$, then $\angle BAC=$

A. 48°
B. 84°
C. 96°
D. 120°
E. 132°

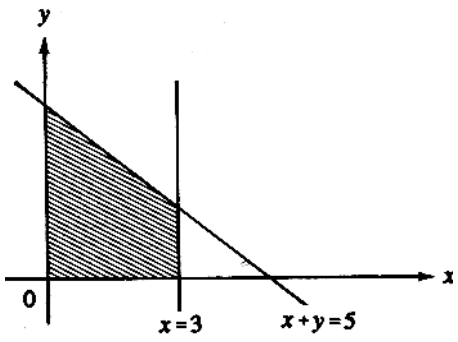


26 The points $A(4,-1)$, $B(-2, 3)$ and $C(x, 5)$ lie on a straight line. Find x.

A. –5
B. –4
C. 0
D. 2
E. 3

27 In the figure, the shaded part is bounded by the axes, the lines $x = 3$ and $x + y = 5$. Find its area.

A. 10.5
B. 12
C. 15
D. 19.5
E. 21



28 AB is a diameter of the circle $x^2 + y^2 - 2x - 2y - 18 = 0$. If A is (3,5), then B is

A. (2 , 3)

B. $(1, -1)$ D. $(-5, -7)$

C. $(-1, -3)$ E. $(-7, -9)$

29 The equations of two circles are $\begin{cases} x^2 + y^2 - 4x - 6y = 0 \\ x^2 + y^2 + 4x + 6y = 0 \end{cases}$

Which of the following is/are true ?

I. The two circles have the same center.

II. The two circles have equal radii.

III. The two circles pass through the origin.

A. I only

B. II only D. I and III only

C. III only E. II and III only

30 In the figure, the pie chart shows the monthly expenditure of a family. If the family spends \$4800 monthly on rent, what is the monthly expenditure on entertainment ?

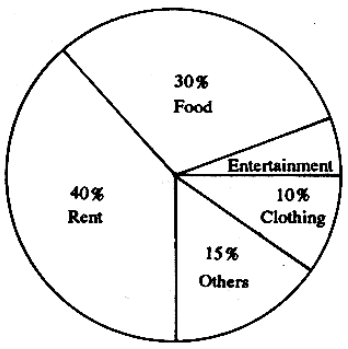
A. \$240

B. \$600

C. \$720

D. \$1 800

E. \$12 000



Monthly Expenditure of a Family

31 A box contains 5 eggs, 2 of which are rotten. If 2 eggs are chosen at random, find the probability that exactly one of them is rotten.

A. $\frac{2}{5}$

B. $\frac{3}{5}$ D. $\frac{6}{25}$

32 The mean, standard deviation and interquartile range of n numbers are m, s and q respectively. If 3 is added to each of the n numbers, what will be their new mean, standard deviation and interquartile range ?

	Mean	Standard Deviation	Interquartile Range
A.	m	s	q
B.	m	$s + 3$	$q + 3$
C.	$m + 3$	s	q
D.	$m + 3$	s	$q + 3$
E.	$m + 3$	$s + 3$	$q + 3$

33 $(3^x)^2 =$

A. $3^{(x^2)}$

B. 3^{x+2} D. 6^x

C. 3^{2x} E. 9^{2x}

34 If $\log 2 = a$ and $\log 9 = b$, then $\log 12 =$

A. $2a + \frac{b}{3}$

B. $2a + \frac{b}{2}$ D. $a^2 + b^{\frac{1}{2}}$

C. $\frac{2}{3}a + \frac{2}{3}b$ E. $a^2 b^{\frac{1}{2}}$

35 Factorize $a^2 - 2ab + b^2 - a + b$.

A. $(a-b)(a-b-1)$

B. $(a-b)(a-b+1)$

C. $(a-b)(a+b-1)$

D. $(a+b)(a-b+1)$

E. $(a-b-1)^2$

36 $$\frac{\frac{2}{x}-\frac{1}{y}}{\frac{4y}{x}-\frac{x}{y}} =$$

A. $2y-x$

B. $2y+x$

C. $\frac{1}{2y-x}$

D. $\frac{1}{2y+x}$

E. $\frac{1}{4y-x}$

37 $P(x)$ is a polynomial. When $P(x)$ is divided by $(5x-2)$, the remainder is R. If $P(x)$ is divided by $(2-5x)$, then the remainder is

A. R

B. $-R$

C. $\frac{2}{5}R$

D. $\frac{2}{5}$

E. $-\frac{2}{5}$

38 In the figure, the line $y=mx+k$ cuts the curve $y=x^2+bx+c$ at $x=\alpha$ and $x=\beta$. Find the value of $\alpha\beta$.

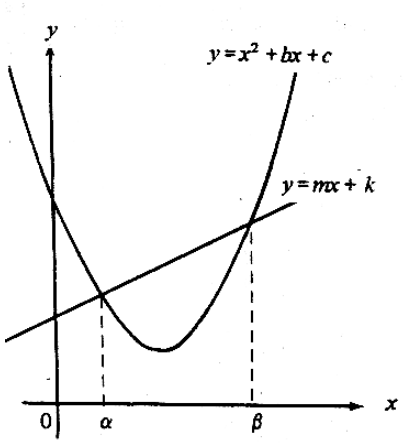
A. $-b$

B. c

C. $m-b$

D. $k-c$

E. $c-k$



39 If $x=3$, $y=2$ satisfy the simultaneous equations $\begin{cases} ax+by=2 \\ bx-ay=3 \end{cases}$, find the values of a and b.

A. $a=0$, $b=1$

B. $a=0$, $b=-1$

C. $a=\frac{5}{6}$, $b=-\frac{1}{4}$

D. $a=-\frac{1}{13}$, $b=\frac{37}{39}$

E. $a=-\frac{12}{13}$, $b=\frac{5}{13}$

40 From the table, which of the following intervals must contain a root of $f(x)-x=0$?

x	$f(x)$
–2	1.2
–1	0.8
0	0.7
1	0.2
2	–0.1
3	0.8

A. $-2 < x < -1$

B. $-1 < x < 0$

C. $0 < x < 1$

D. $1 < x < 2$

E. $2 < x < 3$

41 If the product of the first n terms of the sequence $10,\ 10^2,\ 10^3,\ \ldots,\ 10^n$ exceeds 10^{55}, find the minimum value of n.

A. 9

B. 10

C. 11

D. 12

E. 56

42 If $a:b=2:3$, $a:c=3:4$ and $a:d=4:5$, then $b:c:d=$

A. 2 : 3 : 4

B. 3 : 4 : 5

C. 3 : 6 : 10

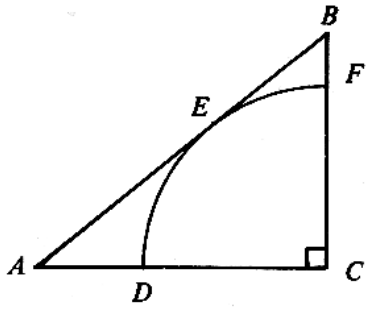
D. 18 : 16 : 15

E. 40 : 45 : 48

43 Let x vary inversely as $\sqrt{y}$. If y is increased by 69%, then x will be

A. increased by 23.1%(3 sig. fig.)
B. increased by 30%
C. decreased by 23.1%(3 sig. fig.)
D. decreased by 30%
E. decreased by 76.9%(3 sig. Fig)

44 In the figure, $CDEF$ is a sector of a circle which touches AB at E. If AB=25 and BC=15, find the radius of the sector.



A. 9

B. 10

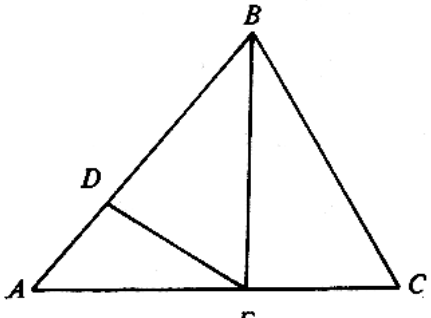
C. 11.25

D. 12

E. 12.5

45 In the figure, $AD:DB$ =1 : 2, $AE:EC$=3 : 2.

Area of ΔBDE : Area of ΔABC=



A. 1 : 3

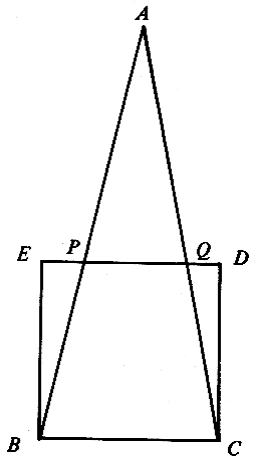
B. 2 : 5

C. 3 : 4

D. 4 : 25

E. 36 : 65

46 In the figure, area of ΔABC : area of square $BCDE$ =2 : 1. Find $PQ : BC$



A. 1 : 2

B. 1 : 3

C. 1 : 4

D. 2 : 3

E. 3 : 4

47 For $0° \le x \le 360°$, how many roots does the equation $\sin x(\cos x + 2) = 0$ have ?

A. 0

B. 1

C. 2

D. 3

E. 4

48 The largest value of $(3\cos 2\theta - 1)^2 + 1$ is

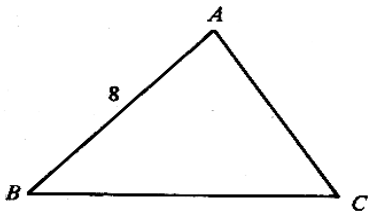
A. 2

B. 5 D. 26

C. 17 E. 50

49 In the figure, $\sin A : \sin B : \sin C = 4 : 5 : 6$.

If AB=8, find AC.



A. $5\frac{1}{3}$

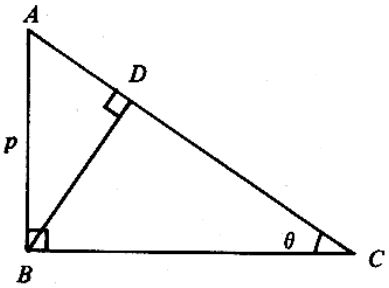
B. $6\frac{2}{3}$

C. $9\frac{3}{5}$

D. 10

E. 12

50 In the figure, $AB = p$, $\angle ACB = \theta$. Find CD.



A. $p\sin\theta$

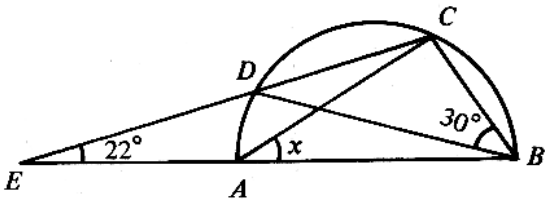
B. $p\cos\theta$

C. $\frac{p\sin\theta}{\cos^2\theta}$

D. $\frac{p\sin^2\theta}{\cos\theta}$

E. $\frac{p\cos^2\theta}{\sin\theta}$

51 In the figure, $ABCD$ is a semi-circle, CDE and BAE are straight lines. If $\angle CBD = 30°$ and $\angle DEA = 22°$, find x.



52 In the figure, $OABCD$ is a sector of a circle. If $\overset{\frown}{AB} = \overset{\frown}{BC} = \overset{\frown}{CD}$, then x =

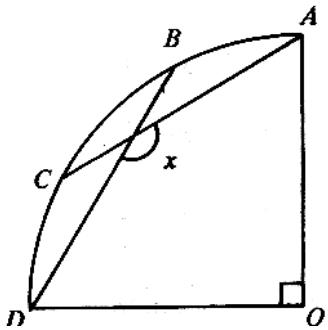
A. 105°

B. 120°

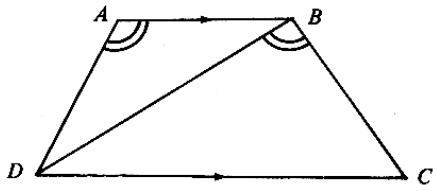
C. 135°

D. 144°

E. 150°



53 In the figure, AB//DC and $\angle DAB = \angle DBC$. Which of the following is/are true ?



I. $\frac{AB}{BD} = \frac{BD}{DC}$

II. $\frac{AB}{BD} = \frac{AD}{BC}$

III. $\frac{AD}{BD} = \frac{BD}{CD}$

A. I only

B. II only D. I and II only

C. III only E. II and III only