



# MATHS

## BOOKS - PEARSON IIT JEE

### FOUNDATION

#### FORMULAS

#### Example

1. Using the formula  $A = \pi r^2$ , find A when  $r=14$  cm (take  $\pi = 22/7$ )



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2. Using the formula  $S = 2(lb + bh + lh)$ , find  $S$  when  $l=12\text{cm}$ ,  $b=8\text{cm}$ , and  $h=4\text{ cm}$ .



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3. Write the formula for finding the circumference ( $C$ ) of a circle with radius  $r$  units. What is the subject in this formula?



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4. Make  $h$  the subject of the formula, where

$V = lbh$ , and find  $h$ , when

$V = 960\text{cm}^3$ ,  $l = 20\text{cm}$ , and  $b = 12\text{cm}$ .



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5. In the formula  $S_n = \frac{n}{2} \{2a + (n - 1)d\}$ ,

make  $d$  as the subject.



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6. Find the value of  $d$ , when

$$S_n = 240, n = 10, \text{ and } a = 6.$$



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7. Make  $f$  as the subject of the formula



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8. If  $u=15$  cm and  $f=6$ cm, then find  $v$ .



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9.  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

If  $f = 3\text{cm}$  and  $v = 4\text{cm}$ , then find  $u$ .



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10. Frame the formula Hypotenuse ( $h$ ) of right triangle is the square root of sum of the squares of perpendicular sides  $a$  and  $b$ .



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**11.** The slant height ( $l$ ) of a cone is the square root of the sum of the squares of its radius ( $r$ ) and its vertical height ( $h$ ). If for a cone,  $l=17\text{cm}$  and  $r = 15\text{ cm}$ , then find  $h$ .



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## Test Your Concepts Very Short Answer Type Questions

**1.** An equation which is used frequently to solve problems is called a formula.



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2. The number of auxiliary formulae which can be derived from  $A = s^2$  is two.



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3. Directions for questions : State whether the following statements are true or false.

Auxiliary formula of  $A = \pi r^2$  is  $r = \frac{A}{\pi}$ .



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4. If  $h^2 = a^2 + b^2$ , then  $b = \sqrt{h^2 - a^2}$ .



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5. Thirty-six is divided into two parts such that one of the parts is twice the other. The two parts are 12 and 24.



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6. There are  $b$  boys and  $g$  girls in a class and the average of number of boys and the number of girls is 18. Then  $b+g=$ \_\_\_\_\_



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7. The number of variable present in RHS of  $A. 2(lb + bh + lh)$  is\_\_\_\_\_.



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8. If the cost of two pens is rsx, then the cost of three pens is \_\_\_\_\_.



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9. In  $A = \frac{x}{360^\circ} \times \pi r^2$ ,  $x = 60^\circ$ , and  $r=6\text{cm}$ ,

then  $A=$ \_\_\_\_\_



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10. the formulae obtained by transforming the subject in the given formula are called\_\_\_\_\_



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11. The symbolic form of "total surface area (A) of a cube is six times the square of its side (s)" is\_\_\_\_\_.



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12. The symbolic form of "area (A) of a rhombus is half of the product of its diagonals ( $d_1, d_2$ )" is \_\_\_\_\_.



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13. The symbolic form of "simple interest (I) is one hundredths of the product principle (P), time period(T) in years, and rate of interest (R)" is \_\_\_\_\_.



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14.  $P=S-C$ , where  $P$  is the profit  $S$  is the price, and  $C$  is the cost price.



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15.  $P = \frac{36}{7}r$ , where  $P$  is the perimeter of the semi-circular region and  $r$  is the radius of the semicircle.



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16. The number of auxiliary formulae that can

be derived from  $S = \frac{(100 - l)}{100} r$  is \_

A. 4

B. 3

C. 2

D. 1

**Answer: C**



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17. If  $V=lbh$ , then  $b=$ \_\_\_\_\_

A.  $\frac{V}{lh}$

B.  $\frac{l}{Vh}$

C.  $\frac{h}{VI}$

D.  $IVh$

**Answer: A**



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18. The symbolic form of "five times b is added in six times a to get the result c" is \_\_\_\_\_

A.  $5b + 6a = c$

B.  $5b - 6a = c$

C.  $6b + 5a = c$

D.  $6b - 5a = c$

**Answer: A**



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19. The subject of the formulae , $A = 2h(l + b)$

is \_\_\_\_\_

A. l

B. b

C. h

D. A

**Answer: D**



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20. A variable standing alone on the left side of an equation is called\_\_\_\_\_

- A. The formula
- B. The subject of the formula
- C. The transposition
- D. None of these

**Answer: B**



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## Test Your Concepts Short Answer Type Questions

1. If  $V = s^3$  and  $V = 216\text{cm}^3$ , then find the value of  $s$  in cm.



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2. In the formula  $\angle P + \angle Q + \angle R + \angle S = 360^\circ$ , if  $\angle P = 100^\circ$ ,  $\angle Q = 100^\circ$ , and  $\angle R = 100^\circ$ , then find  $\angle S$ .



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3. If  $P = \pi r + 2r$  and  $P=36\text{cm}$ , then find the value of  $r$  (in cm).



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4. If  $A = c(a - b)$ , then make 'a' the subject of the formula.



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5. If  $h = \frac{V}{A}$ ,  $h = 5$ , and  $V=60\text{cm}^3$ , then find the value of  $A$  ( $\text{in cm}^2$ ).



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6. The sum of the interior angles in a 6-sided figure is  $720^\circ$  and the six angles are  $x, y, z, z, y,$  and  $x$ . Express the relation among  $x, y,$  and  $z$  by making  $z$  as the subject.



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7. If  $k = a + bc$ , then make 'c' as the subject of the formula.



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8. The compound interest on a sum of  $\text{rs } p$ , for  $T$  years at  $R\%$  per annum is given by

$$I = \left[ \left( 1 + \frac{R}{100} \right)^T - 1 \right] p . \text{ Make } R \text{ as the}$$

subject of the formula .



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9. In the previous question if  $l=662$ ,  $P=2000$ , and  $T=3$ , then find the value of  $R$ .



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10. Let  $C$  denote the temperature of a body in degree Celsius Let  $F$  denote its temperature in degree Fahrenheit. The relation between  $C$  and  $F$  is given by  $\frac{C}{100} = \frac{F - 32}{180}$ . If  $F=2.2C$ , then find the value of  $C$ .



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## Test Your Concepts Essay Type Questions

1. Write all the possible related auxiliary formulae from  $A = \pi(R^2 - r^2)$ .



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2. Make  $g$  the subject of the formula

$$C = \frac{1008}{100 + g} \quad \text{Find } g(\text{in } \%), \text{ when } C = \text{rs}400$$

and  $S = \text{rs}450$ .



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3. Make  $r$  the subject of the formula

$$V = \frac{\pi r^2 h}{3}. \text{ Find } r, \text{ when } V=27\pi \text{ cm}^3 \text{ and}$$

$$h=4\text{cm}.$$



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4. Make 'a' the subject of the formula

$$A = \frac{\sqrt{3}a^2}{4}. \text{ Find } a, \text{ when } A=64 \sqrt{3} \text{ cm}^2.$$



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5. Make  $y$  the subject in  $\frac{x + y}{x - y} = \frac{a + b}{a - b}$



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6. Frame the formula from the following table.

Make  $y$  the subject of the formula.

$X$	1	2	5	7	8
$Y$	1	4	25	49	64



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7. Frame the formula from the following table.

Make  $a$  the subject of the formula.

$a$	$25^\circ$	$34^\circ$	$75^\circ$	$4^\circ$	$89^\circ$	$85^\circ$
$b$	$65^\circ$	$56^\circ$	$15^\circ$	$86^\circ$	$1^\circ$	$5^\circ$



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8. Frame the formula from the following table.

Make  $Z$  the subject of the formula.

$X$	1	2	1	2	3
$Y$	1	2	2	1	4
$Z$	$2\sqrt{2}$	$2\sqrt{2}$	$\sqrt{5}$	$\sqrt{5}$	5



9. If  $(x + a)^2 = x^2 + 1 + \frac{1}{4x^2}$ , then find  $a$ .

A.  $a = \frac{1}{5x}$

B.  $a = \frac{1}{2x}$

C.  $a = \frac{1}{3x}$

D.  $a = \frac{1}{4x}$

**Answer: B**



**10.** A number  $x$  divided by 10 and 7 is added to the quotient and then the sum is multiplied by 3 to give the result  $N$ . Frame the formula by making  $x$  as the subject.



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**11.** If  $A = c(a^2 + b^2)$ , then make  $a$  the subject of the formula.



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$a$	1	2	3	4	5
$b$	2	6	12	20	30

12.

Express the relation between  $a$  and  $b$  with  $b$  as the subject.



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13. If  $\frac{x + y}{z} = \frac{a + b}{c}$ , then make  $y$  the subject of the formula.



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14. If  $d = ut + \frac{1}{2}at^2$ ,  $u = 20$ ,  $a = 10$ , and  $d=50t$ , then find  $t$ .



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15. Find the relation between  $x$  and  $y$  from the data given in the following table.

$x$	2	3	4	5
$y$	5	10	17	26



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## Concept Application Level 1

1. The symbolic form of "the sum of four angles in a quadrilateral PQRS is  $360^\circ$ " is \_\_\_

A.  $\angle P + \angle Q + \angle R + \angle S = 180^\circ$

B.  $\angle P + \angle Q + \angle R + \angle S = 360^\circ$

C.  $\angle P + \angle Q + \angle R + \angle S = 90^\circ$

D.  $\angle P + \angle Q + \angle R + \angle S = 100^\circ$ .

**Answer: B**



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2. The symbolic form of "time taken ( $t$  for a journey is the quotient of distance covered ( $d$ ) and average speed ( $s$ )" is \_\_\_\_

A.  $t = \frac{d}{s}$

B.  $d = \frac{t}{s}$

C.  $\frac{s}{d}$

D.  $t = d + s$

**Answer: A**



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3. The symbolic form of "area of a sector (A) is half of the product length of the arc (l) and radius (r)" is \_\_\_\_\_

A.  $A = lr$

B.  $A = \frac{r}{l}$

C.  $A = \frac{lr}{2}$

D.  $A = \frac{l + r}{2}$

**Answer: C**



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4. The symbolic form of volume ( $v$ ) of a cube is cube of its length ( $s$ )" is \_\_\_\_\_

A.  $V = 3s$

B.  $V = \frac{s}{3}$

C.  $V = s$

D.  $V = s^3$

**Answer: D**



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5. The symbolic form of "area (A) of a trapezium is half of the product of distance between the parallel side (h) and sum of the lengths of parallel sides (a,b)" is \_\_\_\_.

A.  $A = \frac{h}{2}(a + b)$

B.  $A = \frac{h}{2}(a - b)$

C.  $A = \frac{hab}{2}$

D.  $A = hab$

**Answer: A**



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6. The number of auxiliary formulae that can

be derived from  $P = \frac{x}{360^\circ}(2\pi r)$  \_\_\_\_\_

A. 1

B. 2

C. 3

D. 4

**Answer: B**



7. If  $A = \frac{S}{N}$ , then  $N =$  \_\_\_\_\_

A.  $\frac{S}{A}$

B.  $\frac{A}{S}$

C.  $SA$

D.  $S + A$

**Answer: A**



8. The symbolic form of "6 less than twice p is equal to 3 more than q" is \_\_\_\_\_

A.  $2p + 6 = q - 3$

B.  $6 < 2p$

C.  $2p - 6 = q + 3$

D.  $3 > q$

**Answer: C**



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9. The subject of the folulae,  $s = ut + \frac{ut^2}{2}$

is \_\_\_\_\_

A. s

B. u

C. t

D. a

**Answer: A**



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10. the formulae obtained by transforming the subject in the given formula are called\_\_\_\_\_

A. The subject of the formula

B. The transposition

C. An auxiliary formula

D. None of these

**Answer: C**



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11. The cost price  $C$  is given by the formula  $C =$

$$\frac{100s}{100 + g},$$
 where  $S =$  selling price and  $g =$  gain in

%. Make  $S$  the subject of the formula. Find  $S$ , if

$C = \text{rs}800$  and  $g = 20$ . The following steps are

involved in solving the above problem.

Arrange them in sequential order.

(A)  $\Rightarrow 100S = C(100 + g)$

(B)  $S = \frac{(100 + g)C}{100}$

(C) Given  $C = \frac{100S}{100 + g}$

(D)  $\therefore S = \frac{(100 + 20) \times 800}{100} = \text{rs}960$

A. ABCD

B. BCAD

C. CADB

D. CABD

**Answer: D**



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**12.** In the formulae  $S_n = \frac{n}{2} \{2a + (n - 1)d\}$

make  $d$  as the subject

The following steps are involved in solving the above problem. Arrange them in sequential

order.

$$(A) (n - 1)d = \frac{2S_n}{n} - 2a$$

(B)

Given,

$$S_n = \frac{n}{2}[2a + (n - 1)d] \Rightarrow n[2a + (n - 1)d] \\ = 2S_n$$

$$(C) \Rightarrow d = \frac{2}{n - 1} \left[ \frac{S_n}{n} - a \right]$$

$$(D) 2a + (n - 1)d = \frac{2S_n}{n}$$

A. DBAC

B. BDAC

C. ABDC

D. BDCA

**Answer: B**



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**13.** The compound interest on a certain sum is given by  $C. I. = P \left( 1 + \frac{R}{100} \right)^n - P$ . Find

C.I. when  $P = \text{rs}1000$ ,  $R = 10\%$  P.a., and  $n=2$ .

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A)  $\therefore C. I. = \text{rs}210$

(B)  $1000 \left( \frac{11}{10} \right) \left( \frac{11}{10} \right) - 1000 = 1210 - 100$

(C)

Given

$$CI = P \left( 1 + \frac{R}{100} \right)^n - P, P = ₹1000,$$

R=10% p.a., and n=2

$$(D) C.I. = 1000 + \left( 1 + \frac{10}{100} \right)^2 - 1000$$

A. BCDA

B. DCBA

C. CDBA

D. BDCA

**Answer: C**



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**14.** The focal length of a lens is given by the formula  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ . Make  $f$  as the subject of the formula.

if  $u = 20\text{cm}$  and  $v=30$ , then find  $f$ .

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) Given  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

(B)  $\Rightarrow f = \frac{uv}{u + v}$

(C)  $f = \frac{20 \times 30}{20 + 30} = \frac{600}{50} = 12\text{cm}.$

(D)  $\Rightarrow \frac{1}{f} = \frac{v + u}{uv}$

A. ADBC

B. BADC

C. ACDB

D. DBAC

**Answer: A**



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**15. Directions for questions : Match Column A with Column B.**



**Column A**

15. Changing a term from one side of an equation to the other side
16. Coefficient of the subject of a formula
17. In a formula, a variable which is expressed in terms of other variables
18. The circumference ( $C$ ) of a circle is  $\pi$  times its diameter ( $d$ ).

**Column B**

- (a) Subject
- (b) Transposition
- (c)  $C = \pi d$
- (d) 1



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**16.** Directions for questions : Match Column A with Column B.

**Column A**

19. A symbol that occurs alone on LHS of the equality
20. The symbolic form of 'The sum of the angles of  $\triangle ABC$  is  $180^\circ$ .'
21. The symbolic form of 'Perimeter ( $P$ ) of  $\triangle ABC$  is the sum of its sides.'
22. An equation based on a rule

**Column B**

- (a) Formula
- (b) Subject
- (c)  $P = AB + BC + AC$
- (d)  $\angle A + \angle B + \angle C = 180^\circ$



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## Concept Application Level 2

1. If  $A = 2\pi r$ , then  $r =$  \_\_\_\_\_

A.  $2\pi A$

B.  $\frac{2\pi}{A}$

C.  $\frac{2A}{\pi}$

D.  $\frac{A}{2\pi}$

**Answer: D**



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2. In  $A = 2h(l + b)$ , if  $A = 54m^2$ ,  $l=5m$ , and  $b=4m$ , then find  $h$ .

A. 6 m

B. 4 m

C. 3 m

D. 2 m

**Answer: C**



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**3.** If  $A = 2(lb + bh + lh)$ , then which of the following is/are true?

$$\text{A. } I = \frac{A - 2bh}{2(b + h)}$$

$$\text{B. } b = \frac{A - 2lh}{2(l + h)}$$

$$\text{C. } h = \frac{A - 2lb}{2(l + b)}$$

D. All of these

**Answer: D**



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4. The length of an arc of a circle is given by

the formula  $l = \frac{x}{360^\circ} \times 2\pi r$ .

Make  $r$  as the subject of the formula.

$$\text{A. } r = \frac{720^\circ \pi x}{l}$$

$$\text{B. } r = \frac{180^\circ l}{\pi x}$$

$$\text{C. } r = \frac{720^\circ l}{\pi x}$$

$$\text{D. } r = \frac{180^\circ l}{x}$$

**Answer: B**



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**5. Directions for questions :** These questions are based on the following information.

The length of an arc of a circle is given by the

formula  $l = \frac{x}{360^\circ} \times 2\pi r$ .

If  $x = 60^\circ$  and  $r = 3\text{cm}$ , then find  $l$ .

A. 22 cm

B.  $2\pi$  cm

C.  $\pi$  cm

D. 11 cm

**Answer: C**



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6. Directions for questions : These questions are based on the following information.

The length of an arc of a circle is given by the

$$\text{formula } l = \frac{x}{360^\circ} \times 2\pi r.$$

If  $l = 4\pi$  cm and  $r = 18$  cm, then find  $x$ .

A.  $60^\circ$

B.  $90^\circ$

C.  $80^\circ$

D.  $40^\circ$

**Answer: D**





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7. The number of variables in the formula

$$S=ut+\frac{at^2}{2} \text{ is } \_ \_ .$$

A. 4

B. 3

C. 2

D. 1

**Answer: A**



**8.** The number of all possible squares in  $n \times n$  network is equal to  $1^2 + 2^2 + 3^2 + \dots + n^2$ . Find the number of possible squares in  $7 \times 7$  network.

A. 103

B. 91

C. 120

D. 140

**Answer: D**



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**9.** Write the relation between  $H$  and  $m$  from the given table.

<b>Number of hours (<math>H</math>)</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>6</b>	<b>10</b>
<b>Number of minutes (<math>m</math>)</b>	<b>60</b>	<b>180</b>	<b>300</b>	<b>360</b>	<b>600</b>

A.  $H = 60 m$

B.  $m = 60 H$

C.  $H + m = 1$

$$D. m = 30 H$$

**Answer: B**



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**10.** Simple interest on a certain sum is given by

$$I = \frac{PTR}{100}. \text{ Make } T \text{ as the subject of the}$$

formula. Find  $T$  when  $P = \text{rs}1000$ ,  $R = 10\%$  p.a., and

$I = \text{rs} 300$ .

$$A. T = \frac{100I}{PR}, 6 \text{ years}$$

$$\text{B. } T = \frac{100I}{PR}, 3 \text{ years}$$

$$\text{C. } T = \frac{100P}{IR}, 4 \text{ years}$$

$$\text{D. } T = \frac{100R}{PI}, 5 \text{ years}$$

**Answer: B**



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**11.** Directions for questions : Select the correct answer from the given options.

If  $A = S^2$  and  $A = 324\text{cm}^2$ , then find the value of  $S$  (in cm).

A. 162

B.  $(324)^2$

C. 18

D. 16

**Answer: C**



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**12.** In the formula  $\angle A + \angle B + \angle C = 180^\circ$ , if  $\angle A = 90^\circ$  and  $\angle B = 55^\circ$ , then  $\angle C =$  \_\_\_\_\_

A.  $45^\circ$

B.  $45^\circ$

C.  $25^\circ$

D.  $35^\circ$

**Answer: D**



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**13.** Directions for questions : Select the correct answer from the given options.

If  $A = \frac{d_1 d_2}{2}$ ,  $d_1 = 6\text{cm}$ , and  $d_2 = 8\text{cm}$ ,

then find the value of A (in  $\text{cm}^2$  ).

A. 12

B. 18

C. 36

D. 24

**Answer: D**



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14. If  $A = 2h(l + b)$ , then  $b =$  \_\_\_\_\_

A.  $2Ah - 1$

B.  $\left(\frac{A}{2h}\right) - 1$

C.  $2Al - h$

D.  $\frac{A}{2l} - h$

**Answer: B**



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15. If  $S = (n - 2)180^\circ$  and  $S = 540^\circ$ , then find  $n$ .

A. 4

B. 3

C. 5

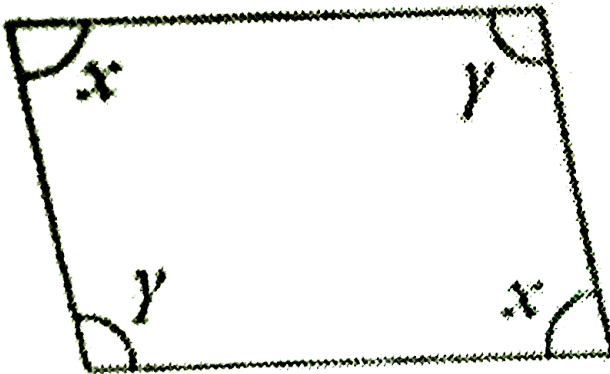
D. 7

**Answer: C**



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16. The sum of four angles of a quadrilateral is  $360^\circ$  from the following figure, express the relation between  $x$  and  $y$  by making  $x$  as the subject.



A.  $x = 180^\circ - y$

B.  $y = 180^\circ - x$

C.  $x = 180^\circ + y$

$$D. y = 180^\circ + x$$

**Answer: A**



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17. If  $M = a + \frac{b}{c}$ , then  $b =$  \_\_\_\_\_

A.  $Mc - a$

B.  $M - ac$

C.  $\frac{(M - a)}{c}$

D.  $(M - a)c$

**Answer: D**



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### Concept Application Level 3

1. Select the correct answer from the given options.

If  $V = lbh$ , then  $h =$  \_\_\_\_\_.

A.  $\frac{V}{lb}$

B.  $\frac{V}{bh}$

C.  $\frac{V}{lh}$

D.  $\frac{lb}{V}$

**Answer: A**



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2. In  $A = s^2 - (s - 2w)^2$ , if  $w=1$  m and  $s=6$ m, then find  $A$  (in  $m^2$ ).

A. 20

B. 10

C. 15

D. 16

**Answer: A**



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**3.** Frame the formula: volume ( $v$ ) of a cuboid is the product of its length ( $l$ ), breadth ( $b$ ), and height ( $h$ ).

A.  $v = lbh$

B.  $v = l + b + h$

C.  $v = \frac{lb}{h}$

D.  $v = h(l + b)$

**Answer: A**



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4. If  $S = \frac{(100 + g)C}{100}$ , then which of the following is/ are true?

A.  $C = \frac{100S}{(100 + g)}$



B.  $g = \frac{100(S - C)}{C}$

C. Both (a) and (b)

D. None of these

**Answer: C**



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5. The number of auxiliary formulae that can be derive from the formula

$$D = \left[ \frac{n(n-1)}{2} \right] - n.$$

A. 1

B. 2

C. 3

D. 4

**Answer: A**



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6. The number of diagonals of a convex polygon of sides  $n$  is equal to  $\frac{n(n-3)}{2}$ . Find

the number of diagonals is hexagon.

A. 9

B. 6

C. 10

D. 8

**Answer: A**



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7. Write the relation between  $x$  and  $y$  from the given table.

$x$	$26^\circ$	$34^\circ$	$75^\circ$	$30^\circ$	$82^\circ$	$10^\circ$
$y$	$64^\circ$	$56^\circ$	$15^\circ$	$60^\circ$	$8^\circ$	$80^\circ$

A.  $x = y - 45^\circ$

B.  $x = y + 54^\circ$

C.  $x = 90^\circ - y$

D.  $x + y = 100^\circ$

**Answer: C**



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**8. Directions for questions :** Select the correct answer from the given options.

The area of four walls of room is given by

$A = 2h(l + b)$ . Make  $l$  as the subject of the

formula. Find  $l$  when

$A = 100\text{m}^2$ ,  $h = 5\text{m}$ , and  $b = 4\text{m}$ .

A.  $l = \frac{A}{2h} - b, 6\text{m}$

B.  $l = \frac{A}{2h} - b, 5\text{m}$

C.  $l = \frac{A}{2b} - h, 4\text{m}$

D.  $l = \frac{A}{2b} - h, 8\text{m}$

**Answer: A**



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9. If  $A = \frac{d}{2}(a + b)$ , then which of the following is/are true?

A.  $d = \frac{2A}{a + b}$

B.  $a = \left(\frac{2A}{d}\right) - b$

C. Both (a) and (b)

D. None of these

**Answer: C**



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**10.** Express the relation between angles  $x$  and  $y$  with  $x$  as the subject.

$X$	$90^\circ$	$100^\circ$	$110^\circ$	$120^\circ$	$130^\circ$	$140^\circ$
$Y$	$90^\circ$	$80^\circ$	$70^\circ$	$60^\circ$	$50^\circ$	$40^\circ$

A.  $y = 180^\circ - x$

B.  $x = 180^\circ - y$

C.  $y = 180^\circ + x$

$$D. x = 180^\circ + y$$

**Answer: B**



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**11.** Directions for questions : Select the correct answer from the given options.

$$\text{If } \frac{a + b}{c + d} = \frac{x}{y}, \text{ then } y = \text{-----} .$$

A.  $y = x(a + b)(c + d)$

B.  $y = \frac{x}{(a + b)(c + d)}$



$$\text{C. } y = \frac{x(c + d)}{a + b}$$

$$\text{D. } y = \frac{x(a + b)}{c + d}$$

**Answer: C**



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## Assessment Tests Test 1

1. The focal length of a lens is given by the formula  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ . Make  $f$  as the subject of the formula.

if  $u = 20\text{cm}$  and  $v=30$ , then find  $f$ .

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) Given  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

(B)  $\Rightarrow f = \frac{uv}{u + v}$

(C)  $f = \frac{20 \times 30}{20 + 30} = \frac{600}{50} = 12\text{cm}.$

(D)  $\Rightarrow \frac{1}{f} = \frac{v + u}{uv}$

A. DBAC

B. DACB

C. DABC

D. DCBA

**Answer: C**



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2. The sum of the digits of a two-digit number is 11. If 9 is subtracted from the number, then the digits interchange their places. Find the number. The following steps are involved in solving the above problem. Arrange them in sequential order

(A) Let the units digit be  $x$ . therefore , the tens digit is  $(11-x)$ .

$\therefore$  The number is

$$10(11 - x) + x = 110 - 9x.$$

(B) Given that

$$110 - 9x - 9 = 9x + 11 \Rightarrow x = 5.$$

(C) Units digit is 5 and tens digit is 6 and the required number is 65.

(D) The number formed by interchanging the digits is  $10x + (11 - x) = 9x + 11$ .

A. ADBC

B. ABDC

C. ABCD

D. BADC

**Answer: A**



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3. If  $A = c(a - b)$ , then  $a$  \_\_\_\_\_

A.  $\left(\frac{A}{c}\right) - b$

B.  $\left(\frac{A}{c}\right) + b$

C.  $\left(\frac{A}{b}\right) - c$

$$D. \left( \frac{A}{b} \right) + c$$

**Answer: B**



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4. The sum of the interior angles in a 6-sided polygon is  $720^\circ$  and the six angles are  $x, y, z, z, y,$  and  $x$ . express the relation among  $x, y,$  and  $z$  by making  $z$  as the subject.

$$A. z = 360^\circ - x + y$$

B.  $z = 360^\circ - (x + y)$

C.  $z = 360^\circ + x - y$

D.  $z = 360^\circ + x + y$

**Answer: B**



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5. If  $k = a + bc$ , then  $c =$  \_\_\_\_\_

A.  $\frac{k + a}{b}$

B.  $\frac{k + b}{a}$

C.  $\frac{k - a}{b}$

D.  $\frac{k - b}{a}$

**Answer: C**



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6. If  $A = c(a^2 + b^2)$ , then which of the following is/are true?

A.  $c = \frac{A}{a^2 - b^2}$

B.  $a = \sqrt{\frac{A}{C} + b^2}$



C. Both (a) and (b)

D. None of these

**Answer: D**



**Watch Video Solution**

7. Express the relation between  $a$  and  $b$  with  $b$  as the subject.

$a$	1	2	3	4	5
$b$	2	6	12	20	30

A.  $b = 2a$

B.  $b = 3a$

C.  $b = (a + 1)^2$

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

**Answer: D**



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8. If  $\frac{x + y}{z} = \frac{a + b}{c}$ , then  $y = \underline{\hspace{2cm}}$

A.  $\frac{(a + b)z}{c} - x$

B.  $\frac{(a + b)z - x}{c}$

C.  $\frac{(a + b)z}{c} + x$

D.  $\frac{(a + b)z + x}{c}$

**Answer: A**



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**9.** One-fifth of a number is 5 more than one-tenth of the number. Find the number

A. 50

B. 75

C. 25

D. 100

**Answer: A**



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**10.** If twice a number is added to half the number, then the result is 250. Find one-tenth of the number.

A. 20

B. 10

C. 50

D. 25

**Answer: B**



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**11.** Which of the following is a solution of

$$2x - 5 > 4x - 3?$$

A. 0

B. 1

C.  $-1$

D.  $-2$

**Answer: D**



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**12.** Directions for questions : Match the Column A with Column B.

**Column A**

12. If  $\frac{t}{5} - \frac{t}{10} = 11 - t$ , then  
 $t =$

13. If  $6.7t + 9.2t + 10.7t - 0.6t = 100 + 6t$ , then  $t =$

14. If three-fifths of a certain number exceeds its one-fourth by 7, then the number is \_\_\_\_\_.

15. The solution of  $\frac{3x}{4} - \frac{x}{4} \leq 4$  is \_\_\_\_\_.

**Column B**

(a) 5

(b) 10

(c) 15

(d) 20

(e) 25

(f) 30



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Assessment Tests Test 2

1. Make  $l$  as the subject of the formula  
 $A=2(lb+bh+hl)$ .

The following steps are involved in solving the above problem Arrange them in sequential order.

A. CBAD

B. CABD

C. CADB

D. ACDB

**Answer: C**





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2. The sum of the digits of a two-digit number is 12. If 18 is subtracted from the number, then the digits interchange their places. Find the number. The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) Units digit is 5, tens digit is 7, and the number is 75.

(B) Given that

$$120 - 9x - 18 = 9x + 12 \Rightarrow 90 = 18x \Rightarrow x = 5$$

•

(C) The number formed by interchanging the digits is  $10x + (12 - x) = 9x + 12$ .

(D) Let the digit in the units place be  $x$ . Then the digit in the tens place be  $(12 - x)$ .  $\therefore$

The number is  $10(12 - x) + x = 120 - 10x + x = 120 - 9x$

•

A. ABCD

B. DCBA

C. DCBA

D. DABC

**Answer: B**



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3. If  $A = 2h(l + b)$ , then  $b = \underline{\hspace{2cm}}$

A.  $2Ah - l$

B.  $\left(\frac{A}{2h}\right) - l$

C.  $2Al - h$

D.  $\frac{A}{2l} - h$

**Answer: B**



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**4. Find the relation between angles  $x$  and  $y$ .**

$x$	$90^\circ$	$100^\circ$	$110^\circ$	$120^\circ$	$130^\circ$	$140^\circ$
$y$	$90^\circ$	$80^\circ$	$70^\circ$	$60^\circ$	$50^\circ$	$40^\circ$

A.  $x = y$

B.  $x + y = 180^\circ$

C.  $x - y = 20^\circ$

D.  $x = 2y$

**Answer: B**



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5. Two-third of a number is 32 less than three-fifth of the number. Find the number

A. 360

B.  $-480$

C.  $-360$

D. 480

**Answer: B**



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6. If one third of a number is subtracted from three times the number, then the result is 800, find the number.

A. 300

B. 400

C. 200

D. 600

**Answer: A**



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7. Which of the following is a solution of

$$\frac{2x - 5}{3} > \frac{3x + 3}{4} ?$$

A.  $x = -5$

B.  $x = -2$

C. Both (a) and (b)

D. Neither (a) nor (b)

**Answer: D**



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**8. Directions for questions : Match Column A with Column B.**

**Column A**

**Column B**

**23.** If  $\frac{x}{10} + \frac{x}{15} + \frac{x}{30} = 3$ ,  
then  $x =$

(a) 10

**24.** If  $1.5t + 2.5t + 3.5t =$   
 $70 + 0.5t$ , then  $t =$

(b) 20

**25.** If  $\frac{2}{3}$  of a certain  
number exceeds its  
one-sixth by 10, then  
the number is \_\_\_\_\_.

(c) -5

**26.** If  $3x + 5 > 25 - x$ ,  $x \in$   
 $Q$  then  $x >$  \_\_\_\_\_.

(d) 5

(e) 15

(f) 25





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