MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

Formulae

Example

1. Write the formula for finding the perimeter P of a square with side 'a' units. What is the subject in this formula?

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2. Write the formula for finding the circumference S of a circle. Make r the subject in this formula and find r when S=154cm.

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3. (a) In the formula $t_n = [a + (n-1)d]$, make 'n' as the subject.

(b) find the value of n when $t_n = 92, a = 1 \text{ and } d = 13$

.

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4. If $z = \frac{4x - 5y}{5x - 4y}$ then express x in terms of y and z.

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5. If $\frac{p+q}{r+s} = \frac{t+u}{v+w}$. Express v in terms of p,q,r,s and w.

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6. In the formula $S = \frac{n}{2}[2a + (n-1)d]$, make a as the subject of the formula.

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7. (a) We know that area of rectangle is equal to the product of its length l and breadth b.

$\therefore$ the formula for the area of the rectangle is given by A=lb.

(b) Consider the statement, 'the circumference of a circle is equal to π times its diameter' frame a formula for this statement.

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8. A steamer can cover k kilometers by consuming l litres of diesel. Write the formula for the distance d, in km covered by the steamer which uses m litres of diesel.

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9. If M_1 men can complete a wrk in D_1 days and M_2 men can complete the same work in D_2 days, write the formula relating them. Given that the number of men at work is inversely proportional to the number of days.

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10. The simple interest for a period of N years at R% per annum on a sum of Rs P is denoted by S.

It equals the product of $\frac{1}{100}$,P,N and R. Express P in terms of S,N and R.

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21. If M_1 men can complete a wrk in D_1 days and M_2 men can complete the same work in D_2 days, write the formula relating them. Given that the number of men at work is inversely proportional to the number of days.

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22. The simple interest for a period of N years at R% per annum on a sum of Rs P is denoted by S.

It equals the product of $\frac{1}{100}$,P,N and R. Express P in terms of S,N and R.

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Very Short Type Question

1. What are the variables in the formula $T = 2\pi\sqrt{\frac{l}{g}}$?

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2. the relation between two or more variables is called a _____

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3. The sum of the terms of an infinite geometric progression is denoted by $S = \frac{a}{1-r}$, change the subject as r.

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4. The variable, which is expressed in terms of other variables, is called____of a formula.

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5. The formula with subject C is $C = \frac{5F - 160}{9}$.

Then what is the formula with subject F?

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6. Lateral surface area (A) of a cone is A=πrl, make l as the subject

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7. When the subject of a formula is chagned, the rule corresponding to the formula also changes. Is the

statement true or false.?

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8. if seve times the curved surface area (A) of a cylinder is equal to 44 times the proudct of base radius (r) and height (h) then what si the formula with subject A?

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9. Make b the subject for the formula $f = \frac{a+b}{a}$.

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10. In the formula $T = 2\pi\sqrt{\frac{l}{g}}$, T is ____proportional to $\sqrt{l}$.

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11. Sum of angles of triangle ABC is 180°. Express the statement using symbols.

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12. The perimeter of a polygon is the ttal length of its sides. In a regular polygon of n sids with x as the length of a side, the perimeter P is_____

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13. The hundredth part of the product of the principal (P), time (T), and rate (R) is simple interest (I), then I is _____express the statement using symbols.

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14. If the curved surface area of a closed cylinder is $2\pi rh$ ad base area is πr^2, then total surface area of that cylinder A is _____

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15. if pressure P is inversely proportional to volume (V) at constant temperature, then PV is constant (True/False)

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16. A formula is based on the equlity property. True or False?

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17. if 16times the area of a square (A) is equal to the perimeter (P) f the square, then A is _____.

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18. Three children have pocket money of x,y and z rupees. The average of their pocket allowances is Rs 15. Then x+y+z=_____.

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19. What are the variables in the formula $A = \pi r^2$?

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20. Ther ratio of T to $\sqrt{l}$ is $\frac{2\pi}{\sqrt{g}}$ then $\sqrt{l}$ is_____.

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Short Answer Type Question

1. Area of a regular polygon of n sides is given by A= $n\frac{\sqrt{3}}{4}a^2 sq.$ Units . Make 'a' the subject of the formula and find 'a' if the area of a hexagon is $54\sqrt{3}$ sq. units.

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2. In the formula $k = \left(\frac{a-b}{a+b}\right)^2$, find the value of b if $k = 36$ and a=3, making b the subject.

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3. In the formula $t_n = \frac{1}{a + (n-1)d}$, how many auxiliary formulae are possible ad what are they?

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4. Write all the auxiliary formulae of $A = P\left(1 + \frac{TR}{100}\right)$

.

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5. Frame the formula for the volume (v) of a cylinder given by the product of π, square of radius (r) and height (h).

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6. A wire of length a units is cut into two equal pieces and make a circle of radius r with one piece. Frame the formula by making r the subject.

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7. In the formula $A = \frac{1}{2}d(h_1 + h - (2))$. Find the value of h_2 if $A = 12$ square units and d=2 square units and $h_1 = 6$ units.

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8. In the formula $k = \left(\frac{a+b}{a-b}\right)^{\frac{1}{2}}$. Rewrite the formula by making 'a' the subject.

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9. Frame the formula for the volume (v) of a hemisphere given by two-thirds o the product of π and cube of radius (r).

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10. A man buys p cycles at a total cost of Rs q annd sells each bicycle at Rs r. if profit $=S.P. - C.P$, find the

profit.

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11. In the formula, $x = \frac{p + 5q}{\sqrt{3} + 2q}$, make q the subject.

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12. A man moevs with p km/h speed for 20 minutes and q km/h for next 30 minutes. Find the expression for this average speed in km/h.

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13. In the formula $S = \sqrt{\frac{p^2 + q}{p - q}}$ make q the subject.

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14. Frame the formula for the area (A) of a quadrilateral given by half the product of its diagonal (d) and sum of offsets drawn to the diagonal from its opposite vertices $(h_1 \text{ and } h_2)$?

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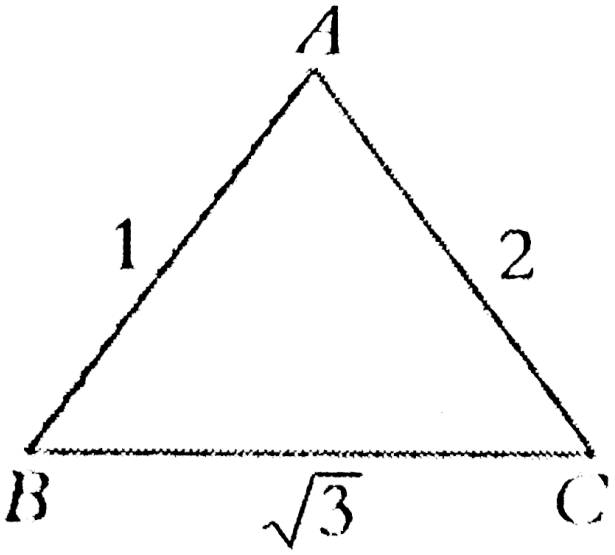
15. In the following figure, (not to scale) ABC is triangle, where AB=1 unit, BC=$\sqrt{3}$ units and AC=2 units



What is the relationship among AB,BC and CA?

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16. A is the area of a circle with radius r units. Write the formula of area, making r as the subject.

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17. In $v^2 - u^2 = 2as$, make a as the subject of the formula.

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18. A is the area of the rectangle with length l units and breadth b units. Rewrite the formula for area making l as the subject.

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19. A is the area of the square with side S units. Write the formula of area making S as the subject.

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20. If $\frac{a}{b} = \frac{b}{c}$, then make c as the subject of the formula.

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21. The height (h) of an equilateral triangle whose side is 's' is $\frac{\sqrt{3}}{2}a$. Find a, if $h = 3\sqrt{3}cm$.

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22. The simple interest on a principal of Rs P at R% per annum for a period of 'I' years is obtained by dividing

the product of P, T and R by 100. The formula for the simple interest is?

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23. If the area of an equilateral tirangle is $A = 12\sqrt{3}cm^2$, then the length of its altitude h is?

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24. If $x^2 + y^2 = r^2$, then x is equal to

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25. In $y = mx + c$, make c as the subject.

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Essey Type Question

1. Find the missing numbers in the following table.

(i) Changing kilometers into miles.

Numbers of kilometers	5	10	15	20	25	30
Number of miles	8	16	24	–	–	–

(ii) Change centrigrade $(.^\circ C)$ into Fehrenheit $(.^\circ F)$

where centigrade scale is divided in 100 equal parts and

Fahrenheit scale is divided into 180 equal parts.

Temperature in $.^\circ C$	-5	0	5	10	15	20
Temperature in $.^\circ F$	23	32	41	–	–	–

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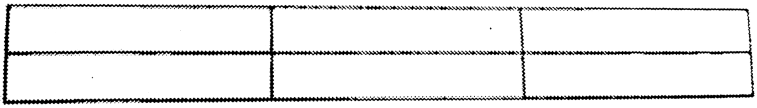
2. The following figure has a network of rectangles. Two rows and three columns.



(A) Totally how many rectangles are there in the figure?

(B) If there are x rectangles in each row and y rectangles in each column, totally how many rectangles will be there in the network, in terms of x and y.

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3. The following table gives the number of sides and the number of diagonals of a polygon.

Number of sides	3	4	5	6	7	8
Number of diagonals	0	2	5	9	14	20

Write a formula to find in terms of n.

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4. In the formula $k = \sqrt{\frac{n^2 - 1}{n^2 + 1}}$, make n the subject and find n if k=0.5.

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5. The diagonal of a rectangle is 10 units. The formula to find the diagonal is $d = \sqrt{l^2 + b^2}$. Where l and b are length and breadth respectively. (10+b)(10-b) is equal to_____.

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Level 1

1. Fahrenheit temperature F is 32 more tha ninefifths of the centrigrade temperature C.

Frame the formula making F as the subject.

A. $F = 32 - \frac{9}{5}C$

B. $F = 32 + \frac{9}{5}C$

C. $F = \frac{9}{5}C - 32$

D. $F = 32 \times \frac{9}{5}C$

Answer: B

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2. If $S = \frac{a}{1-r}$, then make r as the subject of the formula.

A. $r = \frac{a}{S} + 1$

B. $r = 1 + \frac{S}{a}$

C. $r = 1 - \frac{S}{a}$

D. $r = 1 - \frac{a}{S}$

Answer: D

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3. Frame the formula:

final velocity (v) of a body in linear motion is equal to the sum of its initial velocity (u) and the product of acceleration (a) and time (t).

A. v=-u+at

B. v=u-at

C. v=u+at

D. v=-u-at

Answer: C

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4. The nth term of a geometric progression is given by $t_n = ar^{n-1}$ find the value of a, if $t_n = 32, r = 4$ and $n = 5$.

A. $\frac{1}{8}$

B. 8

C. $\frac{1}{4}$

D. 4

Answer: A

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5. if the slant height (l) of a cone is equal to the square root of the sum of the squares of radius (r) and height (h) then,

A. $l = r^2 + h^2$

B. $l = \sqrt{r^2 + h^2}$

C. $l^2 = \sqrt{r^2 + h^2}$

D. $r^2 - h^2 = l^2.$

Answer: B

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6. Write all the possible auxiliary formulae of $A = \pi) R^2 - r^2)$

A. $R = \sqrt{\frac{A - \pi r^2}{\pi}}, r = \sqrt{\frac{R^2\pi + A^2}{\pi}}$

B. $R = \sqrt{\frac{A + \pi r^2}{\pi}}, r = \sqrt{\frac{R^2\pi - A}{\pi}}$

C. $r = \sqrt{\frac{A + \pi r^2}{\pi}}, R = \sqrt{\frac{r^2\pi - A}{\pi}}$

D. none of these

Answer: B

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7. Which of the following is not an auxillary fromula for the area of a quadrilateral i.e., $A = \frac{d}{2}(h_1 + h_2)$?

A. $h_1 = \frac{2A}{d} - h_2$

B. $h_2 = \frac{2A - h_1 d}{d}$

C. $h_1 = \frac{2A}{h_2} - d$

D. $d = \frac{2A}{h_1 + h_2}$

Answer: C

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8. In $s = ut + \frac{1}{2}at^2$, if $s = 16m, t = 2$ seconds and $a = 5m/s^2$, then find the value of u by making u as the

subject.

A. 3m/s

B. 5m/s

C. 2m/s

D. 4m/s

Answer: A

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9. In $r_1 = \frac{A}{s-a}$, if $A = 12cm^2, r_1 = 4cm$ and $a = 3cm$ then find s making s as the subject.

A. 6 cm

B. 8 cm

C. 12 cm

D. 16 cm

Answer: A

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10. In the formula v=u+at, if $a = 5m/s^2$, $t = 3$ seconds and $v = 20m/s$, then u=____.

A. 10m/s

B. 6 m/s

C. 7 m/s

D. 5 m/s

Answer: D

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11. Write the auxiliary formulae related to $x^2 - y^2 = z^2$.

A.

$$x = \sqrt{y^2 + z^2}, y = \sqrt{x^2 - z^2} \text{ and } z = \sqrt{x^2 - y^2}$$

B.

$$x = \sqrt{z^2 + y^2}, y = \sqrt{z^2 + x^2} \text{ and } z^2 = \sqrt{x^2 - y^2}$$

C.

$$x = \sqrt{y^2 + z^2}, y = \sqrt{x^2 - z^2} \text{ and } z = \sqrt{y^2 - x^2}$$

D.

$$z = \sqrt{x^2 - y^2}, y = \sqrt{z^2 + x^2} \text{ and } x = \sqrt{x^2 + y^2}$$

Answer: A

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12. Write the following sentence in symbolic form. Sum of cubes of p and q is equal to thrice the product of r and s.

A. $p^3 - q^3 = 3rs$

B. $p^3 + q^3 = 3rs$

C. $p^3 + q^3 = r^3 s^3$

D. $p^2 + q^2 = 3r^3 s^3$

Answer: B

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13. In the formula $l^2 = r^2 + h^2$, if r=5 and l=13, then find the value of h.

A. 12

B. 144

C. 18

D. 184

Answer: A

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14. In the formula obtained in the problem 12, make the subject as p.

A. $\left(q^3 - 3rs\right)^{\frac{1}{3}}$

B. $\left(3rs - q^3\right)^{\frac{1}{3}}$

C. $\left(q^3 - 3rs\right)^{\frac{1}{3}}$

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

Answer: B

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15. In the formula $H = \frac{2ab}{a+b}$, if a=5 and H=8, then find the value of b.

A. 20

B. $\frac{18}{13}$

C. $\frac{1}{20}$

D. $\frac{13}{18}$

Answer: A

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16. In the formula $r^2 = x^2 + y^2$, if r=25 and x=7, then the positive value of y is

A. 18

B. 24

C. 576

D. 324

Answer: B

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17. Frame the formula: sum of the products of p,x and q,y is equal to r.

A. py+qx=r

B. px-qy=r

C. px+qy=r

D. px+qy+r=0

Answer: C

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18. If $t_n = an^{-1}$, then find the value of n, given that $a = 2, r = 3$ and $t_n = 486.$

A. 5

B. 6

C. 4

D. 8

Answer: B

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19. If $\frac{1}{x} = \frac{1}{y} = \frac{1}{z} + \frac{1}{w}$, then make w as te subject of the formula.

A. $w = \frac{xyz}{xy + 9yz + zx}$

B. $w = \frac{xyz}{yz + zx - xy}$

C. $w = \dfrac{xyz}{xy - yz + zx}$

D. $w = \dfrac{xyz}{xy + yz - zx}$

Answer: B

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20. Frame the formula: The lateral surface area of a cylinder S is equal to twice the product of π, radius (r) and height (h) of the cylinder.

A. $S = \pi^2 r^2 h^2$

B. $S = \pi r h$

C. $2S = \pi r h$

D. $S = 2\pi rh$

Answer: D

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21. Frame the formula for the sentence given below. The sum of the cube of p and the product of 8 and q is equal to the sum of the product of 21, s and the product of 4 and the square of r.

A. $p^3 - 4r^2 = 21s + 8q$

B. $p^3 - 4r^2 = 21s - 8q$

C. $p^3 + 4r^2 = 21s + 8q$

D. none of these

Answer: B

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22. In the formula $t_n = a(n-1)d$, make n as the subject

A. $n = \frac{1}{d}(t_n - a) + 1$

B. $n = \frac{1}{3}(t_n - a) - 1$

C. $n = \frac{1}{d}(t_n - a) + 1$

D. $n = \frac{1}{d}(t_n + a) + 1$

Answer: A

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23. If $s = 2(lb + hb + hl)$, write all the auxiliary formulae of S.

A. $l = \frac{s - 2bh}{2(b + h)}, b = \frac{s - 2hl}{2(h + l)}$ and $h = \frac{s - 2lh}{2(l + h)}$

B. $l = \frac{s - 2bh}{2(b + h)}$ and $h = \frac{s - 2lb}{2(l + b)}$

C. $l = \frac{s - 2bh}{2(b + h)}, b = \frac{s - 2hl}{2(h + l)}$ and $h = \frac{s - 2lh}{2(l + h)}$

D. None of these

Answer: A

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

A. $d = \frac{(z+t)(x+y)}{a+b}$

B. $d = \frac{(z+t)(x+y) - ac - bc}{(a+b)}$

C. $d = \frac{(z+t)(x+y) - ac - bc}{a+b}$

D. $d = \frac{(a+b)(x+\ ) - az - at}{z+t}$

Answer: C

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25. In the formula $p = \frac{3x - 2y}{.}(2x - 3y)$, make x as the subject of the formula.

A. $x = \frac{y(3p - 2)}{2p - 3}$

B. $x = \frac{y(3p - 2)}{2p + 3}$

C. $x = \frac{y(3p + 2)}{2p - 3}$

D. $x = \frac{y(3p + 2)}{2p + 3}$

Answer: A

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26. If the sum of y and ten tims x is equal to the product of x and y, then give the formula with y as the subject.

A. $y = \dfrac{10x}{x-1}$

B. $y = \dfrac{10x}{1-x}$

C. $y = \dfrac{10x}{x+1}$

D. none of these

Answer: A

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27. If the formula $y = \dfrac{a+b}{a-b}$, make a as the subject.

A. $a = \dfrac{b(a+y)}{1-y}$

B. $a = \dfrac{b(1+y)}{a-1}$

C. $a = \dfrac{b(1+y)}{y-1}$

D. $a = \frac{b(1-y)}{1+y}$

Answer: C

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28. In an experiment at a constant temperature (T), pressure (P) is inversely related related to volume (V) and also at constant volume (V), pressure (P) is directly related to temperature (T). The formula according to the above information is (Take the proportionality constant as K).

A. $PVK = T$

B. $PVT = K$

C. $PV = K$

D. $\frac{PV}{T} = K$

Answer: D

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29. In the formula $s = ut + \frac{1}{2}at^2$, make a as the subject of the formula

A. $a = \frac{2s - ut}{t^2}$

B. $a = \frac{2s + 4t}{t^2}$

C. $a = \frac{2(s - ut)}{t^2}$

D. $a = \frac{s - ut}{t^2}$

Answer: C

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30. If the sum of the square of p and twice of q is equal to the square root of the sum of the square of r and s, wirte a formula wth p as the subject.

A. $p = \sqrt{2q - \sqrt{r^2 + s^2}}$

B. $p = \sqrt{r^2 + s^2 - 2q}$

C. $p = \sqrt{2q - r^2 - s^2}$

D. $p = \sqrt{1 - k^2}$

Answer: D

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31. The number of variables in the formula $T = 2\pi\sqrt{\frac{l}{g}}$ is _____

A. 4

B. 5

C. 3

D. 2

Answer: C

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32. Make b as the subject the formula $f = \frac{a+b}{a}$

A. $b = af + a$

B. $b = af - a$

C. $b = \frac{a+f}{a}$

D. $b = \frac{a+f}{f}$

Answer: B

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Level 2

1. The area of an equilateral triangle is $A = \frac{h^2}{\sqrt{3}}$, where h is the length of the altitude. Write the formula making h as the subject

A. $h = \sqrt{3}A$

B. $h = \sqrt{\sqrt{3}A}$

C. $h = \sqrt{\sqrt{3}A}$

D. $h = 3A^2$

Answer: B

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2. In $y = \dfrac{a+b}{a-b}$, make b as the subject of the formula.

A. $b = \dfrac{a(y-1)}{1+y}$

B. $b = \dfrac{a(1+y)}{y-1}$

C. $b = \dfrac{a(y+1)}{1-y}$

D. $b = \dfrac{a(1-y)}{1+y}$

Answer: A

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3. If $H = \dfrac{2b}{a+b}$, then make b as the subject of the formula.

A. $b = \frac{2 + H}{Ha}$

B. $b = \frac{Ha}{2a - H}$

C. $b = \frac{2a - H}{Ha}$

D. $b = \frac{Ha}{2a + H}$

Answer: B

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4. In $\frac{x}{a} + \frac{x}{b} = 1$, make b as the subject of the formula.

A. $b = \left(\frac{x}{a} - 1\right)y$

B. $b = \frac{ay}{x + a}$

C. $b = \frac{ay}{a - x}$

D. $b = \dfrac{a - x}{ay}$

Answer: C

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5. The volume of a cone is $V = \dfrac{1}{3}\pi r^2 h$. Make r as the subject of the formula.

A. $r = \sqrt{\dfrac{3V^2}{\pi h}}$

B. $r = \sqrt{\dfrac{V}{3\pi h}}$

C. $r = \sqrt{\dfrac{3V}{\pi h}}$

D. $r = \sqrt{\dfrac{V}{3\pi h}}$

Answer: C

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6. In the formula $V = \frac{1}{3}pr^2h,$ if V=9.42 units, h=4 units and $\pi = 3.14,$ then r is

A. $\frac{9}{4}$ units

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

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

D. $\frac{4}{9}$ units

Answer: B

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7. If $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, then make v as the subject o the foormula. Also find v, if u=12 units and f=3 units

A. 4 units

B. $\frac{1}{9}$ units

C. 9 units

D. $\frac{1}{4}$ units

Answer: A

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8. In $S = \pi\sqrt{r^2 + h^2}$, make h as the subject of the formula.

A. $h = \sqrt{\frac{S}{\pi r} - r^2}$

B. $h = \sqrt{\frac{S^2}{\pi r^2} + r^2}$

C. $h = \sqrt{\frac{\pi^2 r^2}{S^2} - r^2}$

D. $h = \sqrt{\frac{S^2}{\pi^2 r^2} - r^2}$

Answer: D

Watch Video Solution

9. The general form of a straight line is ax+by+c=0, where a,b,c $\neq$ 0. Make y as the subject of the given equation.

A. $y = \left(\frac{a}{b}\right)x + \left(\frac{c}{b}\right)$

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

C. $y = \left(\frac{-a}{b}\right)x + \left(\frac{c}{b}\right)$

D. $y = \left(\frac{-a}{b}\right)x + \left(\frac{-b}{c}\right)$

Answer: B

Watch Video Solution

10. The volume of a sphere is given by $V = \frac{4}{3}\pi r^3$ Make r as the subject of the formula.

A. $\sqrt{\frac{3V}{4\pi}}$

B. $\frac{3V}{4\pi}$

C. $\left(\frac{3V}{\pi}\right)^{\frac{1}{3}}$

D. $\left(\frac{3V}{4\pi}\right)^{\frac{1}{3}}$

Answer: D

Watch Video Solution

11. Frame the formula: The square of the difference of p and q is equal to the sum of p^2, q^2 and $(-2pq)$

A. $(p-q)^2 = p^2 + q^2 - 2pq$

B. $(p-q)^2 = p^2 + q^2 + 2pq$

C. $(p-q)^2 = p^2 - q^2 - 2pq$

D. $(p+q)^2 = p^2 + q^2 - 2pq$

Answer: A

Watch Video Solution

12. In the formula $p^4 - q^3 = r^2 - s$, make p as the subject of the formula.

A. $p = \left(r^2 - q^3 - s\right)^{\frac{1}{4}}$

B. $p = \left(r^2 - q^3 - s\right)^{\frac{1}{4}}$

C. $p = \left(r^2 + q^3 + s\right)^{\frac{1}{4}}$

D. $p = \left(r^2 + q^3 - s\right)^{\frac{1}{4}}$

Answer: D

Watch Video Solution

13. The total surface area of a cuboid is $S = 2(lb + bh + lh)$. Make l as the subject of the formula.

A. $l = \dfrac{S}{2(b + h)}$

B. $l = \dfrac{S}{b+h} + \dfrac{bh}{b+h}$

C. $l = \dfrac{2-2bh}{2(b+h)}$

D. $l = \dfrac{S-bh}{b+h}$

Answer: C

Watch Video Solution

14. What are the auxiliary formulae of the statement "sum of the angles of a quadrilateral ABCD is 360°," (The four angles of the quadrilateral are A,B,C and D)?

A. $A = 360^\circ - (B+C+D)$

$B = 360^\circ - (A+C+D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A + B + C)$

B. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A + C + D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A - B + C)$

C. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A - C + D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A + B + C)$

D. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A + C + D)$

$$C = 360^\circ - (A - B + D)$$

$$D = 360^\circ - (A - B + C)$$

Answer: A

Watch Video Solution

15. If $S = \frac{a}{1 - r^3}$, then expres r in terms of S and a.

A. $r = \sqrt[3]{1 + \frac{a}{S}}$

B. $r = \sqrt[3]{1 + \frac{S}{a}}$

C. $r = \sqrt[3]{1 - \frac{S}{a}}$

D. $r = \sqrt[3]{1 - \frac{a}{S}}$

Answer: D

Watch Video Solution

16. In $S = ut + \frac{1}{2}at^2, S = 96, t = 8$ and $a = 2$, find u.

A. 2

B. 8

C. 4

D. 1

Answer: C

Watch Video Solution

17. If $C = \frac{5}{9}(F - 32)$, then express F in terms of C.

A. $F = \frac{9}{5}C - 32$

B. $F = 32 - \frac{9}{5}C$

C. $F = \frac{9}{5}(C + 32)$

D. $F = \frac{9}{5}C + 32$

Answer: D

Watch Video Solution

18. If $a = b - \sqrt{b^2 - 1}$, express b in terms of a.

A. $b = \frac{1}{2}\left(a^{-1} - a\right)$

B. $b = \frac{1}{2}\left(a + a^{-1}\right)$

C. $b = \frac{1}{2}\left(a - a^{-1}\right)$

D. $b = \frac{-1}{2}\left(a + a^{-1}\right)$

Answer: B

Watch Video Solution

19. If $\frac{1}{a} + \frac{1}{b} = \frac{1}{c} + \frac{1}{d}$, express a in terms of b,c and d.

A. $a = \frac{bcd}{bc + cd - bd}$

B. $a = \frac{bcd}{cd + bd - bc}$

C. $a = \frac{bcd}{bd + bc + cd}$

D. $a = \frac{bcd}{bd + bc - cd}$

Answer: D

Watch Video Solution

20. If $A = \sqrt{(s-a)(s-b)(s-c)}$, then express c in terms of A,s,a and b.

A. $c = \dfrac{A^2 - a}{(s-a)(s-b)}$

B. $c = s - \dfrac{A^2}{(s-a)(s-b)}$

C. $c = \dfrac{A^2 - s}{(s-a)(s-b)}$

D. none of these

Answer: B

Watch Video Solution

21. $S = \frac{h}{2}[2a + (h-1)d]$, express d in terms of s, h and a.

A. $d = \frac{2s - ah}{h(h-1)}$

B. $d = \frac{2s - 2ah}{h(h-1)}$

C. $d = \frac{s - ah}{sh(h-1)}$

D. $d = \frac{s - 2ah}{h(h-1)}$

Answer: B

Watch Video Solution

Level 3

1. In $P = \dfrac{5x + 2y}{3x - 4y}$, if x=5 and P=7, the y=?

A. 3

B. $\dfrac{3}{8}$

C. $\dfrac{8}{3}$

D. $\dfrac{1}{3}$

Answer: C

Watch Video Solution

2. In the formula $x = y + \sqrt{y^2 + 1}$, make y as the subject of the formula.

A. $y = \frac{1}{2}\left(x^{-1} - x\right)$

B. $y = \frac{1}{2}\left(x - x^{-1}\right)$

C. $y = \frac{1}{2}\left(x^{-1} + x\right)$

D. $y = \frac{1}{2}\left(x^{2} + \frac{1}{x}\right)$

Answer: B

Watch Video Solution

3. In the formula E=3k(1-2c), make c as the subject o the formula.

A. $c = \frac{1}{2} + \frac{E}{6k}$

B. $c = \frac{1}{2} - \frac{E}{3k}$

C. $c = \frac{1}{2} - \frac{E}{6k}$

D. $c = \frac{1}{2} + \frac{E}{3k}$

Answer: C

Watch Video Solution

4. If $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, then make v as the subject of the formula.

A. $v = \frac{u - f}{uf}$

B. $v = \frac{f - u}{fu}$

C. $v = \frac{uf}{u - f}$

D. $v = \frac{uf}{u + f}$

Answer: C

Watch Video Solution

5. The sum of a^2 and cb^3 equals the sum of twice to d and thrice to c. express b in terms of a,c and d.

A. $b = \sqrt[3]{\frac{1}{c}(2d + 3c - a^2)}$

B. $b = \frac{1}{c}\sqrt[3]{2d + 3c - a^2}$

C. $b = \frac{\sqrt[3]{a^2} - 2d - 3c}{c}$

D. none of these

Answer: A

Watch Video Solution

6. In $c = \frac{22a + 9b}{3a + 2b}$, $c = 6$ and $a = 3$, find b.

A. 6

B. 2

C. 4

D. 8

Answer: C

Watch Video Solution

7. The curved surfaec area (c) of a cone is πrl, where $l = \sqrt{r^2 + h^2}$, express h in terms of c and r.

A. $h = \frac{1}{\pi r}\sqrt{c^2 + \pi r^2 r^4}$

B. $h = \frac{1}{\pi r}\sqrt{c - \pi r^2 r^2}$

C. $h = \frac{1}{\pi r}\sqrt{c^2 - \pi r^2 r^2}$

D. $h = \frac{1}{\pi r}\sqrt{c + \pi r^2 r^4}$

Answer: A

Watch Video Solution

Test Your Concepts Very Short Answer Type Question

1. What are the variables in the formula $T = 2\pi\sqrt{\frac{l}{g}}$?

Watch Video Solution

2. the relation between two or more variables is called a _____

Watch Video Solution

3. The sum of the terms of an infinite geometric progression is denoted by $S = \frac{a}{1-r}$, change the subject as r.

Watch Video Solution

4. The variable, which is expressed in terms of other variables, is called____of a formula.

Watch Video Solution

5. The formula with subject C is $C = \frac{5F - 160}{9}$.

Then what is the formula with subject F?

Watch Video Solution

6. Lateral surface area (A) of a cone is A=πrl, make l as the subject

Watch Video Solution

7. When the subject of a formula is chagned, the rule corresponding to the formula also changes. Is the statement true or false.?

Watch Video Solution

8. if seven times the curved surface area (A) of a cylinder is equal to 44 times the proudct of base radius (r) and height (h) then what si the formula with subject A?

Watch Video Solution

9. Make b the subject for the formula $f = \frac{a+b}{a}$.

Watch Video Solution

10. In the formula $T = 2\pi\sqrt{\frac{l}{g}}$, T is ____proportional to $\sqrt{l}$.

Watch Video Solution

11. Sum of angles of triangle ABC is 180°. Express the statement using symbols.

Watch Video Solution

12. The perimeter of a polygon is the ttal length of its sides. In a regular polygon of n sids with x as the length of a side, the perimeter P is_____

Watch Video Solution

13. The hundredth part of the product of the principal (P), time (T), and rate (R) is simple interest (I), then I is _____express the statement using symbols.

Watch Video Solution

14. If the curved surface area of a closed cylinder is $2\pi rh$ ad base area is πr^2, then total surface area of that cylinder A is _____

Watch Video Solution

15. if pressure P is inversely proportional to volume (V) at constant temperature, then PV is constant (True/False)

Watch Video Solution

16. A formula is based on the equlity property. True or False?

Watch Video Solution

17. if 16times the area of a square (A) is equal to the perimeter (P) f the square, then A is _____.

Watch Video Solution

18. Three children have pocket money of x,y and z rupees. The average of their pocket allowances is Rs 15. Then x+y+z=_____.

Watch Video Solution

19. What are the variables in the formula $A = \pi r^2$?

Watch Video Solution

20. Ther ratio of T to $\sqrt{l}$ is $\frac{2\pi}{\sqrt{g}}$ then $\sqrt{l}$ is_____.

Watch Video Solution

Test Your Concepts Short Answer Type Question

1. Area of a regular polygon of n sides is given by A= $n\frac{\sqrt{3}}{4}a^2 sq.$ Units . Make 'a' the subject of the formula and find 'a' if the area of a hexagon is $54\sqrt{3}$ sq. units.

Watch Video Solution

2. In the formula $k = \left(\frac{a-b}{a+b}\right)^2$, find the value of b if $k = 36$ and a=3, making b the subject.

Watch Video Solution

3. In the formula $t_n = \frac{1}{a+(n-1)d}$, how many auxiliary formulae are possible ad what are they?

Watch Video Solution

4. Write all the auxiliary formulae of $A = P\left(1 + \frac{TR}{100}\right)$

.

Watch Video Solution

5. Frame the formula for the volume (v) of a cylinder given by the product of π, square of radius (r) and height (h).

Watch Video Solution

6. A wire of length a units is cut into two equal pieces and make a circle of radius r with one piece. Frame the formula by making r the subject.

Watch Video Solution

7. In the formula $A = \frac{1}{2}d(h_1 + h_2)$. Find the value of h_2 if $A = 12$ square units and d=2 square units and $h_1 = 6$ units.

Watch Video Solution

8. In the formula $k = \left(\frac{a+b}{a-b}\right)^{\frac{1}{2}}$. Rewrite the formula by making 'a' the subject.

Watch Video Solution

9. Frame the formula for the volume (v) of a hemisphere given by two-thirds o the product of π and cube of radius (r).

Watch Video Solution

10. A man buys p cycles at a total cost of Rs q annd sells each bicycle at Rs r. if profit $=S.P. - C.P$, find the

profit.

Watch Video Solution

11. In the formula, $x = \frac{p + 5q}{\sqrt{3} + 2q}$, make q the subject.

Watch Video Solution

12. A man moevs with p km/h speed for 20 minutes and q km/h for next 30 minutes. Find the expression for this average speed in km/h.

Watch Video Solution

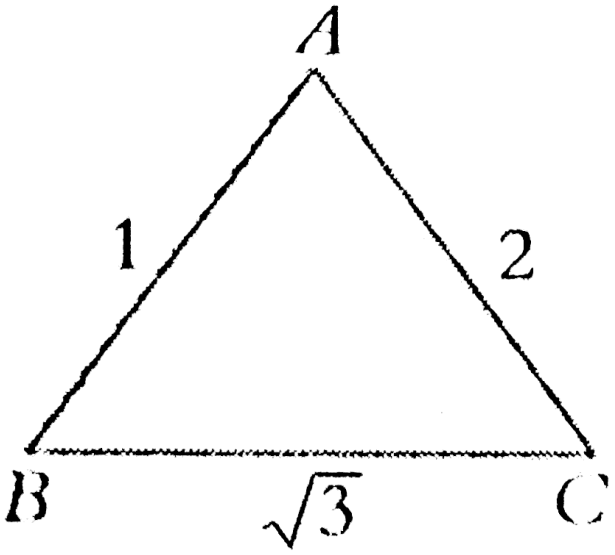
13. In the formula $S = \sqrt{\frac{p^2 + q}{p - q}}$ make q the subject.

Watch Video Solution

14. Frame the formula for the area (A) of a quadrilateral given by half the product of its diagonal (d) and sum of offsets drawn to the diagonal from its opposite vertices $(h_1 \text{ and } h_2)$?

Watch Video Solution

15. In the following figure, (not to scale) ABC is triangle, where AB=1 unit, BC=$\sqrt{3}$ units and AC=2 units



What is the relationship among AB,BC and CA?

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16. A is the area of a circle with radius r units. Write the formula of area, making r as the subject.

Watch Video Solution

17. In $v^2 - u^2 = 2as$, make a as the subject of the formula.

Watch Video Solution

18. A is the area of the rectangle with length l units and breadth b units. Rewrite the formula for area making l as the subject.

Watch Video Solution

19. A is the area of the square with side S units. Write the formula of area making S as the subject.

Watch Video Solution

20. If $\frac{a}{b} = \frac{b}{c}$, then make c as the subject of the formula.

Watch Video Solution

21. The height (h) of an equilateral triangle whose side is 'a' is $\frac{\sqrt{3}}{2}a$. Find a, if $h = 3\sqrt{3}cm$.

Watch Video Solution

22. The simple interest on a principal of Rs P at R% per annum for a period of 'I' years is obtained by dividing

the product of P, T and R by 100. The formula for the simple interest is?

Watch Video Solution

23. If the area of an equilateral tirangle is $A = 12\sqrt{3}cm^2$, then the length of its altitude h is?

Watch Video Solution

24. If $x^2 + y^2 = r^2$, then x is equal to

Watch Video Solution

25. In $y = mx + c$, make c as the subject.

Watch Video Solution

Test Your Concepts Easy Type Question

1. Find the missing numbers in the following table.

Changing kilometers into miles.

Number of kilometres	5	10	15	20	25	30
Number of miles	8	16	24	-	-	-

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2. Find the missing numbers in the following table.

(i) Changing kilometers into miles.

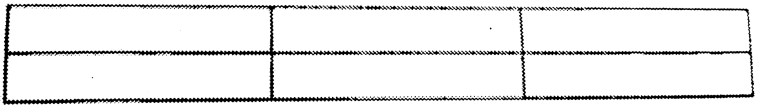
Numbers of kilometers	5	10	15	20	25	30
Number of miles	8	16	24	–	–	–

(ii) Change centrigrade $(.^\circ C)$ into Fehrenheit $(.^\circ F)$ where centigrade scale is divided in 100 equal parts and Fahrenheit scale is divided into 180 equal parts.

Temperature in $.^\circ C$	-5	0	5	10	15	20
Temperature in $.^\circ F$	23	32	41	–	–	–

Watch Video Solution

3. The following figure has a network of rectangles. Two rows and three columns.



(A) Totally how many rectangles are there in the figure?

(B) If there are x rectangles in each row and y rectangles in each column, totally how many rectangles will be there in the network, in terms of x and y.

Watch Video Solution

4. If $y = \tan^{-1}(\sec x - \tan x)$, then differentiation of y wrt x is equal to= ?

Watch Video Solution

5. In the formula $k = \sqrt{\frac{n^2 - 1}{n^2 + 1}}$, make n the subject and find n if k=0.5.

Watch Video Solution

6. The diagonal of a rectangle is 10 units. The formula to find the diagonal is $d = \sqrt{l^2 + b^2}$. Where l and b are length and breadth respectively. (10+b)(10-b) is equal to_____.

Watch Video Solution

Concept Application Level 1

1. Fahrenheit temperature F is 32 more tha ninefifths of the centrigrade temperature C.

Frame the formula making F as the subject.

A. $F = 32 - \frac{9}{5}C$

B. $F = 32 + \frac{9}{5}C$

C. $F = \frac{9}{5}C - 32$

D. $F = 32 \times \frac{9}{5}C$

Answer: B

Watch Video Solution

2. If $S = \frac{a}{1-r}$, then make r as the subject of the formula.

A. $r = \frac{a}{S} + 1$

B. $r = 1 + \frac{S}{a}$

C. $r = 1 - \frac{S}{a}$

D. $r = 1 - \frac{a}{S}$

Answer: D

Watch Video Solution

3. Frame the formula:

final velocity (v) of a body in linear motion is equal to the sum of its initial velocity (u) and the product of acceleration (a) and time (t).

A. $v = -u + at$

B. $v = u - at$

C. $v = u + at$

D. $v = -u - at$

Answer: C

Watch Video Solution

4. The nth term of a geometric progression is given by $t_n = ar^{n-1}$ find the value of a, if $t_n = 32, r = 4$ and $n = 5$.

A. $\frac{1}{8}$

B. 8

C. $\frac{1}{4}$

D. 4

Answer: A

Watch Video Solution

5. if the slant height (l) of a cone is equal to the square root of the sum of the squares of radius (r) and height (h) then,

A. $l = r^2 + h^2$

B. $l = \sqrt{r^2 + h^2}$

C. $l^2 = \sqrt{r^2 + h^2}$

D. $r^2 - h^2 = l^2$

Answer: B

Watch Video Solution

6. Write all the possible auxiliary formulae of $A = \pi\left(R^2 - r^2\right)$

A. $R = \sqrt{\frac{A - \pi r^2}{\pi}} = \sqrt{\frac{R^2\pi + A^2}{\pi}}$

B. $R = \sqrt{\frac{A + \pi r^2}{\pi}}, r = \sqrt{\frac{R^2\pi - A}{\pi}}$

C. $r = \sqrt{\frac{A + \pi r^2}{\pi}}, R = \sqrt{\frac{r^2\pi - A}{\pi}}$

D. $R = \sqrt{\frac{A - \pi r^2}{\pi}}, r = \sqrt{\frac{R^2\pi - A}{\pi}}$

Answer: B

Watch Video Solution

7. Which of the following is not an auxillary fromula for the area of a quadrilateral i.e., $A = \frac{d}{2}(h_1 + h_2)$?

A. $h_1 = \frac{2A}{d} - h_2$

B. $h_2 = \frac{2A - h_1 d}{d}$

C. $h_1 = \frac{2A}{h_2} - d$

D. $d = \frac{2A}{h_1 + h_2}$

Answer: C

Watch Video Solution

8. In $s = ut + \frac{1}{2}at^2$, if $s = 16m, t = 2$ seconds and $a = 5m/s^2$, then find the value of u by making u as the subject.

A. 3 m/s

B. 5 m/s

C. 2 m/s

D. 4 m/s

Answer: A

Watch Video Solution

9. In $r_1 = \frac{A}{s-a}$, if $A = 12cm^2, r_1 = 4cm$ and $a = 3cm$ then find s making s as the subject.

A. 6 cm

B. 8 cm

C. 12 cm

D. 16 cm

Answer: A

Watch Video Solution

10. In the formula v=u+at, if $a = 5m/s^2, t = 3$ seconds and $v = 20m/s,$ then u=____.

A. 10 m/s

B. 6 m/s

C. 7 m/s

D. 5 m/s

Answer: D

Watch Video Solution

11. Write the auxiliary formulae related to $x^2 - y^2 = z^2.$

A.

$$x = \sqrt{y^2 + z^2}, y = \sqrt{x^2 - z^2}, \text{ and } z = \sqrt{x^2 - y^2}$$

B.

$$x = \sqrt{z^2 + y^2}, y = \sqrt{z^2 - x^2} \text{ and } z^2 = \sqrt{x^2 - y^2}$$

C.

$$x = \sqrt{y^2 + z^2}, y = \sqrt{x^2 - z^2}, \text{ and } z = \sqrt{y^2 - x^2}$$

D.

$$z = \sqrt{x^2 - y^2}, y = \sqrt{z^2 + x^2}, \text{ and } x = \sqrt{x^2 + y^2}$$

Answer: A

 Watch Video Solution

12. Write the following sentence in symbolic form. Sum of cubes of p and q is equal to thrice the product of r and s.

A. $p^3 - q^3 = 3rs$

B. $p^3 + q^3 = 3rs$

C. $p^3 + q^3 = r^3s^3$

D. $p^2 + q^2 = 3r^3s^3$

Answer: B

Watch Video Solution

13. In the formula $l^2 = r^2 + h^2$, if r=5 and l=13, then find the value of h.

A. 12

B. 144

C. 18

D. 184

Answer: A

Watch Video Solution

14. In the formula obtained in the problem 12, make the subject as p.

A. $\left(-q^3-3rs\right)^{\frac{1}{3}}$

B. $\left(3rs-q^3\right)^{\frac{1}{3}}$

C. $\left(q^3-3rs\right)^{\frac{1}{3}}$

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

Answer: B

Watch Video Solution

15. In the formula $H=\frac{2ab}{a+b}$, if a=5 and H=8, then find the value of b.

A. 20

B. $\frac{18}{13}$

C. $\frac{1}{20}$

D. $\frac{13}{18}$

Answer: A

Watch Video Solution

16. In the formula $r^2 = x^2 + y^2$, if r=25 and x=7, then the positive value of y is

A. 18

B. 24

C. 576

D. 324

Answer: B

Watch Video Solution

17. Frame the formula: sum of the products of p,x and q,y is equal to r.

A. $py + qx = r$

B. $px - qy = r$

C. $px + qy = r$

D. $px + qy + r = 0$

Answer: C

Watch Video Solution

18. If $t_n = ar^{n-1}$, then find the value of n, given that $a = 2, r = 3$ and $t_n = 486.$

A. 5

B. 6

C. 4

D. 8

Answer: B

Watch Video Solution

19. If $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}+\frac{1}{w}$, then make w as te subject of the formula.

A. $w=\frac{xyz}{xy+9yz+zx}$

B. $w=\frac{xyz}{yz+zx-xy}$

C. $w=\frac{xyz}{xy-yz+zx}$

D. $w=\frac{xyz}{xy+yz-zx}$

Answer: B

Watch Video Solution

20. Frame the formula: The lateral surface area of a cylinder S is equal to twice the product of π, radius (r)

and height (h) of the cylinder.

A. $S = \pi^2 r^2 h^2$

B. $S = \pi r h$

C. $2S = \pi r h$

D. $S = 2\pi r h$

Answer: D

Watch Video Solution

21. Frame the formula for the sentence given below. The sum of the cube of p and the product of 8 and q is

equal to the sum of the product of 21, s and the product of 4 and the square of r.

A. $p^3 - 4r^2 = 21s + 8q$

B. $p^3 - 4r^2 = 21s - 8q$

C. $p^3 + 4r^2 = 21s + 8q$

D. $p^2 - 4r^2 = 21s - 8q$

Answer: B

Watch Video Solution

22. In the formula $t_n = a(n-1)d$, make n as the subject

A. $n = \frac{1}{d}(t_n - a) + 1$

B. $n = \frac{1}{d}(t_n - a) - 1$

C. $n = \frac{1}{d}(t_n + a) - 1$

D. $n = \frac{1}{d}(t_n + a) + 1$

Answer: A

Watch Video Solution

23. If $s = 2(lb + hb + hl)$, write all the auxiliary formulae of S.

A.

$$l = \frac{s - 2bh}{2(b + h)}, b = \frac{s - 2hl}{2(h + l)}, \text{ and } h = \frac{s - 2lh}{2(l + h)}$$

B. $l = \dfrac{s - 2bh}{2(b + h)}$, and $h = \dfrac{s - 2lb}{2(l + b)}$

C.

$$l = \frac{s - 2bh}{2(b + h)}, b, = \frac{s - 2hl}{2(h + l)} \text{ and } h = \frac{2 - 2lh}{(l + h)}$$

D. $l = \dfrac{2 - 2bh}{2(b + h)}$ and $h = \dfrac{s - 2lb}{(l + b)}$

Answer: A

Watch Video Solution

24. If $\dfrac{a + b}{x + y} = \dfrac{z + t}{c + d}$, then make d as the subject of the formula.

A. $d = \dfrac{(z + t)(x + y)}{a + b}$

B. $d = \dfrac{(z + t)(x + y) - c}{a + b}$

C. $d = \dfrac{(z+t)(x+y) - ac - bc}{a+b}$

D. $d = \dfrac{(z+t)(x+y) - az - at}{z+t}$

Answer: C

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25. In the formula $p = \dfrac{3x - 2y}{2x - 3y}$, make x as the subject of the formula.

A. $x = \dfrac{y(3p-2)}{2p-3}$

B. $x = \dfrac{y(3p-2)}{2p+3}$

C. $x = \dfrac{y(3p+2)}{2p-3}$

D. $x = \dfrac{y(3p+2)}{2p+3}$

Answer: A

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26. If the sum of y and ten tims x is equal to the product of x and y, then give the formula with y as the subject.

A. $y = \frac{10x}{x - 1}$

B. $y = \frac{10x}{1 - x}$

C. $y = \frac{10x}{x + 1}$

D. $y = \frac{10}{1 - x}$

Answer: A

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27. If the formula $y = \frac{a+b}{a-b}$, make a as the subject.

A. $a = \frac{b(1+y)}{1-y}$

B. $a = \frac{b(1+y)}{a-1}$

C. $a = \frac{b(1+y)}{y-1}$

D. $a = \frac{b(1-y)}{1+y}$

Answer: C

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28. In an experiment at a constant temperature (T), pressure (P) is inversely related related to volume (V)

and also at constant volume (V), pressure (P) is directly related to temperature (T). The formula according to the above information is (Take the proportionality constant as K).

A. $PVK = T$

B. $PVT = K$

C. $PV = K$

D. $\frac{PV}{T} = K$

Answer: D

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29. In the formula $s = ut + \frac{1}{2}at^2$, make a as the subject of the formula

A. $a = \frac{2s - ut}{t^2}$

B. $a = \frac{2s + 4t}{t^2}$

C. $a = \frac{2(s - ut)}{t^2}$

D. $a = \frac{s - ut}{t^2}$

Answer: C

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30. If the sum of the square of p and twice of q is equal to the square root of the sum of the square of r and s,

wirte a formula wth p as the subject.

A. $p = \sqrt{2p - \sqrt{r^2 + s^2}}$

B. $p = \sqrt{r^2 + s^2 - 2q}$

C. $p = \sqrt{2q - r^2 - s^2}$

D. $p = \sqrt{1 - k^2}$

Answer: D

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31. The number of variables in the formula $T = 2\pi\sqrt{\frac{l}{g}}$ is _____

A. 4

B. 5

C. 3

D. 2

Answer: C

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32. Make b as the subject the formula $f = \frac{a+b}{a}$

A. $b = af + a$

B. $b = af - a$

C. $b = \frac{a+f}{a}$

D. $b = \dfrac{a+f}{f}$

Answer: B

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Concept Application Level 2

1. The area of an equilateral triangle is $A = \dfrac{h^2}{\sqrt{3}}$, where h is the length of the altitude. Write the formula making h as the subject

A. $h = \sqrt{3}A$

B. $h = \sqrt{\sqrt{3}A}$

C. $h = \sqrt{\sqrt{3A}}$

D. $h = 3A^2$

Answer: B

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2. In $y = \dfrac{a+b}{a-b}$, make b as the subject of the formula.

A. $b = \dfrac{a(\gamma - 1)}{1 + \gamma}$

B. $b = \dfrac{a(1 + \gamma)}{\gamma - 1}$

C. $b = \dfrac{a(\gamma + 1)}{1 - \gamma}$

D. $b = \dfrac{a(1 - \gamma)}{1 + \gamma}$

Answer: A

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3. If $H = \frac{2b}{a+b}$, then make b as the subject of the formula.

A. $b = \frac{2+H}{Ha}$

B. $b = \frac{Ha}{2a-H}$

C. $b = \frac{2a-H}{Ha}$

D. $b = \frac{Ha}{2a+H}$

Answer: B

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4. In $\frac{x}{a} + \frac{x}{b} = 1$, make b as the subject of the formula.

A. $b = \left(\frac{x}{a} - 1\right)\gamma$

B. $b = \frac{a\gamma}{x + a}$

C. $b = \frac{a\gamma}{a - x}$

D. $b = \frac{a + x}{ay}$

Answer: C

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5. The volume of a cone is $V = \frac{1}{3}\pi r^2 h$. Make r as the subject of the formula.

A. $r = \sqrt{\frac{3V^2}{\pi h}}$

B. $r = \sqrt{\frac{V}{3\pi h}}$

C. $r = \sqrt{\frac{3V}{\pi h}}$

D. $r = \sqrt{\frac{V}{3\pi h}}$

Answer: C

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6. In the formula $V = \frac{1}{3}pr^2h,$ if V=9.42 units, h=4 units and $\pi = 3.14,$ then r is

A. $\frac{9}{4}$ units

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

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

D. $\frac{4}{9}$ units

Answer: B

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7. If $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, then make v as the subject o the foormula. Also find v, if u=12 units and f=3 units

A. 4 units

B. $\frac{1}{9}$ units

C. 9 units

D. $\frac{1}{4}$ units

Answer: A

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8. In $S = \pi\sqrt{r^2 + h^2}$, make h as the subject of the formula.

A. $h = \sqrt{\frac{S}{\pi r} - r^2}$

B. $h = \sqrt{\frac{S^2}{\pi r^2} + r^2}$

C. $h = \sqrt{\frac{\pi^2 r^2}{S^2} - r^2}$

D. $h = \sqrt{\frac{S^2}{\pi^2 r^2} - r^2}$

Answer: D

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9. The general form of a straight line is ax+by+c=0, where a,b,c $\neq$ 0. Make y as the subject of the given equation.

A. $y = \left(\frac{a}{b}\right)x + \left(\frac{c}{b}\right)$

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

C. $y = \left(\frac{-a}{b}\right)x + \left(\frac{c}{b}\right)$

D. $y = \left(\frac{-a}{b}\right)x + \left(\frac{-b}{c}\right)$

Answer: B

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10. The volume of a sphere is given by $V = \frac{4}{3}\pi r^3$ Make r as the subject of the formula.

A. $\sqrt{\frac{3V}{4\pi}}$

B. $\frac{3V}{4\pi}$

C. $\left(\frac{3V}{\pi}\right)^{\frac{1}{3}}$

D. $\left(\frac{3V}{4\pi}\right)^{\frac{1}{3}}$

Answer: D

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11. Frame the formula: The square of the difference of p and q is equal to the sum of p^2, q^2 and $(-2pq)$

A. $(p-q)^2 = p^2 + q^2 - 2pq$

B. $(p-q)^2 = p^2 + q^2 + 2pq$

C. $(p-q)^2 = p^2 - q^2 - 2pq$

D. $(p+q)^2 = p^2 + q^2 - 2pq$

Answer: A

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12. In the formula $p^4 - q^3 = r^2 - s$, make p as the subject of the formula.

A. $p = \left(r^2 - q^3 - s\right)^{\frac{1}{4}}$

B. $p = \left(r^2 - q^3 + s\right)^{\frac{1}{4}}$

C. $p = \left(r^2 + q^3 + s\right)^{\frac{1}{4}}$

D. $p = \left(r^2 + q^3 - s\right)^{\frac{1}{4}}$

Answer: D

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13. The total surface area of a cuboid is $S = 2(lb + bh + lh)$. Make l as the subject of the formula.

A. $l = \dfrac{S}{2(b+h)}$

B. $l = \dfrac{S}{b+h} + \dfrac{bh}{b+h}$

C. $l = \dfrac{S - 2bh}{2(b+h)}$

D. $l = \dfrac{S - bh}{b + h}$

Answer: C

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14. What are the auxiliary formulae of the statement "sum of the angles of a quadrilateral ABCD is 360°," (The four angles of the quadrilateral are A,B,C and D)?

A. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A + C + D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A + B + C)$

B. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A + C + D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A - B + C)$

C. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A - C + D)$

$C = 360^\circ - (A + B + D)$

$D = 360^\circ - (A + B + C)$

D. $A = 360^\circ - (B + C + D)$

$B = 360^\circ - (A + C + D)$

$C = 360^\circ - (A - B + D)$

$D = 360^\circ - (A - B + C)$

Answer: A

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15. If $S = \frac{a}{1 - r^3}$, then expres r in terms of S and a.

A. $r = \sqrt[3]{1 + \frac{a}{2}}$

B. $r = \sqrt[3]{1 + \frac{S}{a}}$

C. $r = \sqrt[3]{1 - \frac{S}{a}}$

D. $r = \sqrt[3]{1 - \frac{a}{S}}$

Answer: D

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16. In $S = ut + \frac{1}{2}at^2, S = 96, t = 8$ and $a = 2$, find u.

A. 2

B. 8

C. 4

D. 1

Answer: C

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17. If $C = \frac{5}{9}(F - 32)$, then express F in terms of C.

A. $F = \frac{9}{5}C - 32$

B. $F = 32 - \frac{9}{5}C$

C. $F = \frac{9}{5}(C + 32)$

D. $F = \frac{9}{5}C + 32$

Answer: D

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18. If $a = b - \sqrt{b^2 - 1}$, express b in terms of a.

A. $b = \frac{1}{2}\left(a^{-1} - a\right)$

B. $b = \frac{1}{2}\left(a + a^{-1}\right)$

C. $b = \frac{1}{2}\left(a - a^{-1}\right)$

D. $b = \frac{-1}{2}\left(a + a^{-1}\right)$

Answer: B

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19. If $\frac{1}{a}+\frac{1}{b}=\frac{1}{c}+\frac{1}{d}$, express a in terms of b,c and d.

A. $a=\frac{bcd}{bc+cd-bd}$

B. $a=\frac{bcd}{cd+bd-bc}$

C. $a=\frac{bcd}{bd+bc+cd}$

D. $a=\frac{bcd}{bd+bc-cd}$

Answer: D

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20. If $A = \sqrt{(s-a)(s-b)(s-c)}$, then express c in terms of A,s,a and b.

A. $c = \dfrac{A^2 - s}{(s-a)(s-b)}$

B. $c = s - \dfrac{A^2}{(s-a)(s-b)}$

C. $c = \dfrac{A^2 - s}{(s-a)(s-b)}$

D. $c = s + \dfrac{A^2}{(s-a)(s-b)}$

Answer: B

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21. $S = \dfrac{h}{2}[2a + (h-1)d]$, express d in terms of s, h and a.

A. $d = \dfrac{2s - ah}{h(h-1)}$

B. $d = \dfrac{2s - 2ah}{h(h-1)}$

C. $d = \dfrac{s - ah}{sh(h-1)}$

D. $d = \dfrac{s - 2ah}{h(h-1)}$

Answer: B

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Concept Application Level 3

1. In $P = \dfrac{5x + 2y}{3x - 4y}$, if x=5 and P=7, the y=?

A. 3

B. $\frac{3}{8}$

C. $\frac{8}{3}$

D. $\frac{1}{3}$

Answer: C

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2. In the formula $x = y + \sqrt{y^2 + 1}$, make y as the subject of the formula.

A. $y = \frac{1}{2}\left(x^{-1} - x\right)$

B. $y = \frac{1}{2}\left(x - x^{-1}\right)$

C. $y = \frac{1}{2}\left(x^{-1} + x\right)$

D. $y = \frac{1}{2}\left(x^2 + \frac{1}{x}\right)$

Answer: B

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3. In the formula E=3k(1-2c), make c as the subject o the formula.

A. $c = \frac{1}{2} + \frac{E}{6k}$

B. $c = \frac{1}{2} - \frac{E}{3k}$

C. $c = \frac{1}{2} - \frac{E}{6k}$

D. $c = \frac{1}{2} + \frac{E}{3k}$

Answer: C

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4. If $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, then make v as the subject of the formula.

A. $v = \frac{u - f}{uf}$

B. $v = \frac{f - u}{fu}$

C. $v = \frac{uf}{u - f}$

D. $v = \frac{uf}{u + f}$

Answer: C

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5. The sum of a^2 and cb^3 equals the sum of twice to d and thrice to c. express b in terms of a,c and d.

A. $b = \sqrt[3]{\frac{1}{2}(2d + 3c - a^2)}$

B. $b = \frac{1}{c}\sqrt[3]{2d + 3c - a^2}$

C. $b = \frac{\sqrt[3]{a^2} - 2d - 3c}{c}$

D. $b = \sqrt[3]{\frac{1}{2}(2d + 3c + a^2)}$

Answer: A

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6. In $c = \frac{22a + 9b}{3a + 2b}$, $c = 6$ and $a = 3$, find b.

A. 6

B. 2

C. 4

D. 8

Answer: C

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7. The curved surfaec area (c) of a cone is πrl, where $l = \sqrt{r^2 + h^2}$, express h in terms of c and r.

A. $h = \frac{1}{\pi r}\sqrt{c^2 - \pi^2 r^4}$

B. $h = \frac{1}{\pi r}\sqrt{c - \pi^2 r^2}$

C. $h = \frac{1}{\pi r}\sqrt{c^2 - \pi^2 r^2}$

D. $h = \frac{1}{\pi r}\sqrt{c + \pi^2 r^4}$

Answer: A

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