

1

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The formula $d = rt$ is used to calculate the distance an object travels over a period of time, t , at a constant rate, r . Based on this formula, what is the rate, r , in terms of d and t ?

A) $r = \frac{d}{t}$ C) $r = \frac{t}{d}$

B) $r = dt$ D) $r = d - t$

2

3

The formula below is often used by project managers to compute E , the estimated time to complete a job, where O is the shortest completion time, P is the longest completion time, and M is the most likely completion time.

$$E = \frac{O + 4M + P}{6}$$

Which of the following correctly gives P in terms of E , O , and M ?

A) $P = 6E - O - 4M$ C) $P = \frac{O + 4M + E}{6}$

B) $P = -6E + O + 4M$ D) $P = \frac{O + 4M - E}{6}$

3

4

The equation $y = \sqrt{\frac{hg}{x}}$ relates to the positive numbers g , h , x , and y . Which equation correctly expresses h in terms of g , x , and y ?

A) $h = gxy$

B) $h = gxy^2$

C) $h = \frac{gy^2}{x}$

D) $h = \frac{xy^2}{g}$

4

4

A rectangle has perimeter P , length ℓ and width w . Which of the following represents ℓ in terms of P and w ?

A) $\ell = P - w$

B) $\ell = \frac{2P - w}{2}$

C) $\ell = \frac{P - 2w}{2}$

D) $\ell = 2P - 2w$

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$$z = \frac{x+3}{2y}$$

The given equation relates the distinct positive real numbers x , y , and z . Which equation correctly expresses x in terms of y and z ?

A) $x = 2yz + 3$

B) $x = 2yz - 3$

C) $x = \frac{z}{2y} - 3$

D) $x = \frac{z-3}{2y}$

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If the expression $\frac{4x^2}{2x-1}$ is written in the equivalent form $\frac{1}{2x-1} + A$, what is A in terms of x ?

A) $2x + 1$

B) $2x - 1$

C) $4x^2$

D) $4x^2 - 1$

7

6

The equation $y = \frac{x+w}{z}$ relates the positive numbers w , x , y , and z . Which equation correctly expresses x in terms of w , y , and z ?

A) $x = yz - w$ C) $x = \frac{z}{wy}$
 B) $x = yz + w$ D) $x = \frac{y}{zw}$

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$C = \frac{5(R - 491.67)}{9}$

The equation above expresses the temperature C , in degrees Celsius, in terms of the temperature R , in degrees Rankine. Which of the following expresses the temperature in degrees Rankine in terms of the temperature in degrees Celsius?

A) $R = \frac{9}{5}C + 491.67$
 B) $R = \frac{9}{5}C - 491.67$
 C) $R = \frac{5}{9}C + 491.67$
 D) $R = \frac{5}{9}C - 491.67$

9

6

$0.8p = t$

At a store, a coat originally priced at p dollars is on sale for t dollars, and the relationship between p and t is given in the equation above. What is p in terms of t ?

A) $p = t - 0.8$ C) $p = \frac{0.8}{t}$
 B) $p = 0.8t$ D) $p = \frac{t}{0.8}$

10

7

A bricklayer uses the formula $n = 7\ell h$ to estimate the number of bricks, n , needed to build a wall that is ℓ feet long and h feet high. Which of the following correctly expresses ℓ in terms of n and h ?

A) $\ell = \frac{7}{nh}$ C) $\ell = \frac{n}{7h}$
 B) $\ell = \frac{h}{7n}$ D) $\ell = \frac{n}{7+h}$

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$m = \frac{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N}{\left(1 + \frac{r}{1,200}\right)^N - 1} P$

The formula above gives the monthly payment m needed to pay off a loan of P dollars at r percent annual interest over N months. Which of the following gives P in terms of m , r , and N ?

A) $P = \frac{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N}{\left(1 + \frac{r}{1,200}\right)^N - 1} m$
 B) $P = \frac{\left(1 + \frac{r}{1,200}\right)^N - 1}{\left(\frac{r}{1,200}\right)\left(1 + \frac{r}{1,200}\right)^N} m$
 C) $P = \left(\frac{r}{1,200}\right) m$
 D) $P = \frac{1,200}{r} m$

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The formula for determining the pressure, p , exerted on an object at a depth, h , below the surface of a liquid is $p = s + dgh$, where s is the atmospheric pressure, d is the density of the liquid, and g is the acceleration due to gravity. Which formula represents h in terms of p , s , d , and g ?

A) $h = \frac{p}{s} + dg$
 B) $h = \frac{p-s}{dg}$
 C) $h = ps - dg$
 D) $h = ps + dg$

1 A 4 C 7 A 10 C
2 A 5 B 8 A 11 B
3 D 6 A 9 D 12 B