5alik re5m

$(a+b)^2 = a^2 + 2ab + b^2$

$(a-b)^2 = a^2 - 2ab + b^2$

$a^2 - b^2 = (a-b)(a+b)$

$a^2 + b^2$

$a^2 - b^2 = 20$, $a - b = 5$

$a + b =$ .....

$(a-b)(a+b) = 20$

$5(a+b) = 20$

$a + b = \frac{20}{5}$

$a + b = 4$

1

$$4x^2 - 9 = (px + t)(px - t)$$

In the equation above, p and t are constants. Which of the following could be the value of p?

A) 2

B) 3

C) 4

D) 9

2

If $a^2 + b^2 = 20$ and $ab = 8$, then what is $(b - a)^2$?

(Grid in)

$(b-a)^2 = b^2 - 2ab + a^2$

$= 20 - 2(8)$

$= 20 - 16$

$= 4$

$(a+b)^2 = a^2 + 2ab + b^2$

$(a-b)^2 = a^2 - 2ab + b^2$

$a^2 - b^2 = (a-b)(a+b)$

3

If $a^2 - b^2 = 21$ and $a - b = 3$, what is the value of $a + b$?

$(a-b)(a+b) = 21$

$3(a+b) = 21$

$a + b = \frac{21}{3}$

7

4

$$4x^5 - 16x^3y^2 + 16xy^4$$

Which of the following is equivalent to the expression shown above?

A. $x(2x^2 - 2y)^2$

B. $x^2(2x^2 - 2y^2)^2$

C. $x(2x^2 - 4y^2)^2$

D. $x(4x^2 - 4y^2)^2$

$$2x + 5 = 9$$

$$2x = 9 - 5$$

$$x = \frac{9-5}{2}$$

$$ax + b = C$$

$$ax = C - b$$

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

1

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) $\ell = \frac{7}{nh}$

B) $\ell = \frac{h}{7n}$

C) $\ell = \frac{n}{7h}$

D) $\ell = \frac{n}{7+h}$

2

The distance d, in feet, traveled by a failing object t seconds after the object is dropped can be modeled by the equation $d = 16t^2$. Which of the following expresses the number of seconds after the object is dropped in terms of the distance traveled?

A) $t = \frac{4}{\sqrt{d}}$

B) $t = \frac{\sqrt{d}}{4}$

C) $t = \frac{4}{d^2}$

D) $t = \frac{d^2}{4}$

3

$0.8p = t$

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) $p = t - 0.8$

B) $p = 0.8t$

C) $p = \frac{0.8}{t}$

D) $p = \frac{t}{0.8}$

4

$Q = \sqrt{\frac{2dK}{h}}$

The formula above is used to estimate the ideal quantity, Q, of items a store manager needs to order given the demand quantity, d; the setup cost per order, K; and the storage cost per item, h. Which of the following correctly expresses the storage cost per item in terms of the other variables?

A. $h = \sqrt{\frac{2dK}{Q}}$

B. $h = \frac{\sqrt{2dK}}{Q}$

C. $h = \frac{2dK}{Q^2}$

D. $h = \frac{Q^2}{2dK}$

IF $f(x) = 2x + 5$

Find:

$f(4) = 2(4) + 5 = 8 + 5 = 13$

$f(-5) = 2(-5) + 5 = -10 + 5 = -5$

$f(m) = 2m + 5$

$f(K) = 2K + 5$

$f(2a) = 2(2a) + 5$

$= 4a + 5$

$f(x) = 2x + 5$

1

$f(x) = x - 1$

For the function f defined by the equation shown, which of the following is the value of $f(6)$?

A) −6

B) −5

C) 5

D) 7

2

If $h(x) = 3x + 5$ and $h(a) = 27$, then what is the value of a?

3

If $f(x) = x^2 - 1$, and $f(2a) = 35$, then what could be the value of a?

(A) −6
(B) −3
(C) 1
(D) 2

4

If $f(x) = 2x - 5$, then what is the value of $f(2) + f(5)$?

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

5

The function $h(x) = x^2 - ax - 3$ has zeros at $x = 3$ and $x = -1$. What is the value of a? (grid-in)

Circles

$(x-h)^2+(y-k)^2=r^2$ | $x^2+ax+y^2+by=c$

Center (h,k) | Center $(\frac{a}{-2},\frac{b}{-2})$

radius $=\sqrt{r^2}$ | radius $=\sqrt{(\frac{a}{-2})^2+(\frac{b}{-2})^2+c}$

$x^2+y^2=c$

1

Which of the following is an equation of a circle in the xy-plane with center $(3, -1)$ and a radius of 4?

A) $(x-3)^2+(y+1)^2=4$

B) $(x-3)^2+(y+1)^2=16$

C) $(x+1)^2+(y-3)^2=4$

D) $(x+3)^2+(y-1)^2=16$

$=4^2$

$=16$

2

$\frac{3}{a}=\frac{7}{28}=\frac{14}{56}$

$3x+7y=14$

$ax+28y=56$

$a=\frac{3\times 28}{7}$

$=12$

In the system of the equation above, a is a constant. If the system has infinitely many solutions, what is the value of a?

A) 2

B) 3

C) 4

D) 12

$ax+by=c$

$dx+ey=f$

0 $\frac{a}{d}=\frac{b}{e}$

1 $\frac{a}{d}\neq\frac{b}{e}$

∞ $\frac{a}{d}=\frac{b}{e}=\frac{c}{f}$

3

For $i=\sqrt{-1}$, which of the following is equivalent to $\frac{2i-3}{i-5}$?

$\times\frac{i+5}{i+5}$

$i^2=-1$

$i^3=-i$

$i^4=1$

$\frac{0}{4}$

i

A. $\frac{13-7i}{24}$

B. $\frac{13-13i}{24}$

C. $\frac{17-7i}{26}$

D. $\frac{17-13i}{24}$

$\frac{i^2-25}{-1-25}=\frac{-26}{-26}$

4

$$2x-3y=22$$

$$-4x+5y=-66$$

If (x, y) is the solution of the system above, what is the value of y?

5

Which of the following is equal to $(5+2i)(5-2i)$? (Note: $i=\sqrt{-1}$)

A) 21

B) 29

C) $21-20i$

D) $29+20i$

6

If $a^2+b^2=20$ and $ab=8$, then what is $(b-a)^2$?

(Grid in)

1

If the area of a circle is $\frac{\pi}{4}$, what is the diameter of the circle?

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 1

D) $\frac{3}{2}$

2

A multiple *choice* test contains 50 questions. A correct answer is worth 3 points and an incorrect answer is worth -2 points. If a student receives 75 on the test, how many questions did he answer correctly?

3

Black holes are massive objects in the universe. The Schwarzschild Radius of a black hole is the maximum distance at which an object can escape the gravitational pull of the black hole. It is given by $R = \frac{2GM}{c^2}$, R is the Schwarzschild Radius, G is called the gravitational constant, M is the mass of the black hole, and c is the speed of light in vacuum. What is c in terms of G, M, and R?

A. $c = \sqrt{\frac{R}{2GM}}$

B. $c = \sqrt{2GMR}$

C. $c = \sqrt{\frac{GMR}{2}}$

D. $c = \sqrt{\frac{2GM}{R}}$

4

$$2x + y = 5$$

$$x + y = 3$$

If (x, y) is the solution to the system of equations above, what is the value of $3x + 2y$?

A) 1

B) 2

C) 8

D) 15

5

If $h(x) = 3x + 5$ and $h(a) = 27$, then what is the value of a?

6

In the xy-plane, the graph of $2x^2 - 6x + 2y^2 + 2y = 45$ is a circle. What is the radius of the circle?

A) 5

B) 6.5

C) $\sqrt{40}$

D) $\sqrt{50}$

IF $f(x) = 2x + 1$

$g(x) = x^2$

Find:

$F(g(2))$

$g(2) = (2)^2$

$= 4$

$f(4) = 2(4) + 1 = 9$

$g(F(2))$

$f(2) = 2(2) + 1 = 5$

$g(5) = (5)^2 = 25$

$(F \circ g)(x) = f(g)$

$= 2g + 1$

$= 2x^2 + 1$

$f(x) = 2x + 1$

$g(x) = x^2$

$(g \circ f)(x) = g(f(x))$

$= f^2$

$= (2x+1)^2$