1

A. SUBSTITUTE (2) $2x - y = 8(2)$

$x + 2y = 4$

For the system of equations above, what is the value of $x + y$?

A) −1
B) 4
C) 5
D) 20

B. ADD $4x - 2y = 16$ + $x + 2y = 4$ → $5x = 20$, $x = 4$

C. PLUG BACK IN $x + 2y = 4$ → $4 + 2y = 4$, $2y = 0$, $y = 0$

D. $x + y = 4 + 0 = 4$

2

Which of the following is equivalent to $2(x^2 - x) + 3(x^2 - x)$?

NOTICE EQUATION ALSO EQUALS $5(x^2 - x)$

A) $5x^2 - 5x$
B) $5x^2 + 5x$
C) $5x$
D) $5x^2$

A. DISTRIBUTE $2x^2 - 2x + 3x^2 - 3x$

B. REDUCE/COLLAPSE $5x^2 - 5x$

3

A. SOLVE FOR Y $2y - 3x = -4$, $2y = 3x - 4$, $y = \frac{3}{2}x - \frac{4}{2}$

Which of the following statements is true about the graph of the equation $2y - 3x = -4$ in the xy-plane?

A) It has a negative slope and a positive y-intercept.
B) It has a negative slope and a negative y-intercept.
C) It has a positive slope and a positive y-intercept.
D) It has a positive slope and a negative y-intercept.

B. NOW MATCH WITH ANSWER P.O.E.

4

A. TRANSLATE ENGLISH TO MATH: SLOPE ANSWERS $y = mx + b$, $h = 8s + 15$

The front of a roller-coaster car is at the bottom of a hill and is 15 feet above the ground. If the front of the roller-coaster car rises at a constant rate of 8 feet per second, which of the following equations gives the height h, in feet, of the front of the roller-coaster car s seconds after it starts up the hill?

B. MATCH ANSWER

A) $h = 8s + 15$
B) $h = 15s + \frac{335}{8}$
C) $h = 8s + \frac{335}{15}$
D) $h = 15s + 8$

5

$C = 75h + 125$

The equation above gives the amount C, in dollars, an electrician charges for a job that takes h hours. Ms. Sanchez and Mr. Roland each hired this electrician. The electrician worked 2 hours longer on Ms. Sanchez's job than on Mr. Roland's job. How much more did the electrician charge Ms. Sanchez than Mr. Roland?

A. LABEL B. PLUG IN

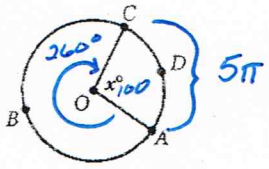
A) $75
B) $125
C) $150
D) $275

S: $C = 75(2) + 125 = 150 + 125 = 275$

R: $C = 75(0) + 125 = 0 + 125 = 125$

C. SUBTRACT $275 - 125 = 150$

6



The circle above has center O, the length of arc $\overset{\frown}{ADC}$ is 5π, and $x = 100$. What is the length of arc $\overset{\frown}{ABC}$?

A. LABEL

A) 9π
B) 13π
C) 18π
D) $\frac{13}{2}\pi$

B. RATIOS $100 : 5\pi$, $260 : x$

C. CROSSMULTIPLY $100x = 1300\pi$, $x = 13\pi$

7

If $\frac{8}{x} = 160$, what is the value of x?

A) 1,280
B) 80
C) 20
D) 0.05

A. CROSSMULTIPLY $\frac{8}{x} = \frac{160}{1}$, $160x = 8$, $x = \frac{8}{160} = \frac{1}{20} = .05$

8

SLICK!

$2ax - 15 = 3(x + 5) + 5(x - 1)$

In the equation above, a is a constant. If no value of x satisfies the equation, what is the value of a?

= PARALLEL LINES = SAME SLOPE

A) 1
B) 2
C) 4
D) 8

A. DISTRIBUTE $2ax - 15 = 3x + 15 + 5x - 5$

$2ax - 15 = 8x + 10$

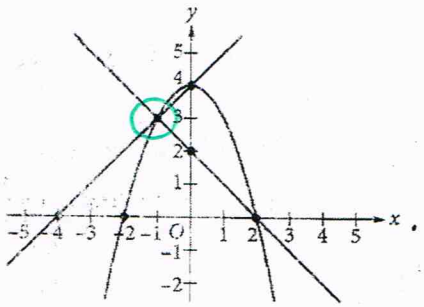
B. NOTICE SLOPES

$2ax = 8x$

$a = \frac{8x}{2x} = 4$

C. SOLVE FOR a.

9



A system of three equations is graphed in the xy-plane above. How many solutions does the system have?

A. WHERE DO ALL 3 SYSTEMS MEET?

A) None
B) One
C) Two
D) Three

10 SLICK

$(ax+3)(5x^2-bx+4) = 20x^3-9x^2-2x+12$

The equation above is true for all x, where a and b are constants. What is the value of ab?

A) 18
B) 20
C) 24
D) 40

A. DISTRIBUTE
$5ax^3-abx^2+4ax+15x^2-3bx+12$
B. NOTICE ab IS WITH x^2
so, $-abx^2+15x^2=-9x^2$
$24x^2=abx^2$
$24=ab$

11

$$\frac{x}{x-3}=\frac{2x}{2}$$

Which of the following represents all the possible values of x that satisfy the equation above?

A) 0 and 2
B) 0 and 4
C) −4 and 4
D) 4

A. PLUG IN ANSWERS OR CROSS-MULTIPLY
$2x=2x^2-6x$
$0=2x^2-8x$
$0=2x(x-4)$
$x=0 \quad x=4$

12

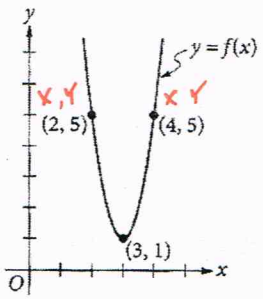
$$\frac{1}{2x+1}+5$$

Which of the following is equivalent to the expression above for $x>0$?

A) $\frac{2x+5}{2x+1}$
B) $\frac{2x+6}{2x+1}$
C) $\frac{10x+5}{2x+1}$
D) $\frac{10x+6}{2x+1}$

A. ADDING FRACTIONS
$\frac{1}{2x+1}+\frac{5}{1}=$
B. COMMON DENOMINATOR
$\frac{1}{2x+1}+\frac{10x+5}{2x+1}=\frac{10x+6}{2x+1}$

13



The graph of the function f in the xy-plane above is a parabola. Which of the following defines f?

A) $f(x)=4(x-3)^2+1$
B) $f(x)=4(x+3)^2+1$
C) $f(x)=(x-3)^2+1$
D) $f(x)=3(x+3)^2+1$

A. P.O.E.
B. PLUG IN AND MATCH. $x=4 \; y=5$ $x=2 \; y=5$
C. TRY C.
$(4-3)^2+1 \neq 5$
D. TRY A.
$4(4-3)^2+1=5$ YES!
$4+1=5$

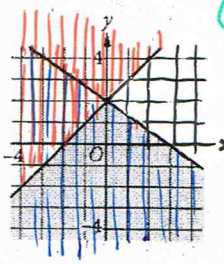
14

$y \geq x+2$ A. SOLVE FOR Y $y \geq x+2$
$2x+3y \leq 6$ $y \leq -\frac{2}{3}x+6$

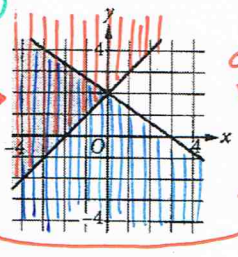
In which of the following does the shaded region represent the solution set in the xy-plane to the system of inequalities above?

B. P.O.E. C & D

A)

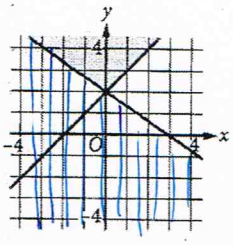


B)

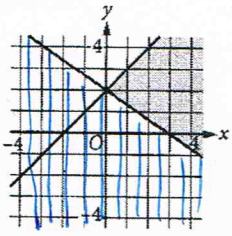


C. NOTICE WHERE THEY CROSS / SHADE OVER

C)



D)



SLICK

15

What is the set of all solutions to the equation $\sqrt{x+2}=-x$?

A) {−1, 2}
B) {−1}
C) {2}
D) There are no solutions to the given equation.

A. PLUG IN
$\sqrt{x+2}=-x$
$\sqrt{-1+2}=-(-1)$
$\sqrt{1}=1$

16

What is the volume, in cubic centimeters, of a right rectangular prism that has a length of 4 centimeters, a width of 9 centimeters, and a height of 10 centimeters?

VOLUME = lwh
= 4 · 9 · 10
= 360

17

$$4x + 2 = 4$$

If x satisfies the equation above, what is the value of $2x + 1$?

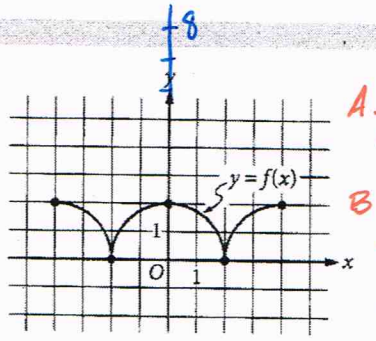
A. SOLVE FOR X
$4x + 2 = 4$
$4x = 2$
$x = \frac{2}{4} = \frac{1}{2} = .5$

B. THEN PLUG IN
$2x + 1 = 2(.5) + 1$
$= 2$

OR

C. NOTICE RATIOS $= \frac{2}{1}$
$4x + 2 = 4$
$2x + 1 = x$
$x = 2$

18



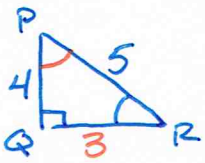
The figure above shows the complete graph of the function f in the xy-plane. The function g (not shown) is defined by $g(x) = f(x) + 6$. What is the maximum value of the function g?

A. NOTICE WHEN $x = 0$ $y = 2$

B. SO
$g(x) = f(x) + 6$
$g(x) = f(0) + 6$
$= 2 + 6$
$= 8$

19

Triangle PQR has right angle Q. If $\sin R = \frac{4}{5}$, what is the value of $\tan P$?

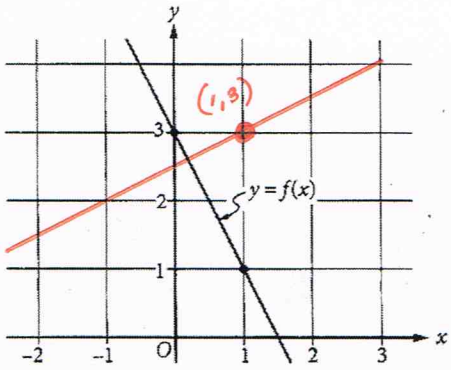


A. LABEL
SIN R = $\frac{O}{H} = \frac{4}{5}$

B. NOTICE 3-4-5 TRIANGLE

C. TAN P
$\frac{O}{A} = \frac{3}{4}$

20



The graph of the linear function f is shown in the xy-plane above. The graph of the linear function g (not shown) is perpendicular to the graph of f and passes through the point $(1, 3)$. What is the value of $g(0)$?

A. LABEL

B. FIGURE f(x) FORMULA
$y = -\frac{2}{1}x + 3$

C. FIGURE g(x) PERPENDICULAR FORMULA AND ITS LINE
$y = +\frac{1}{2}x + b$

d. USE (1,3) TO GET b
NOTICE g(0) = y INTERCEPT
$3 = \frac{1}{2}(1) + b$
$3 = .5 + b$
$2.5 = b$

e. SOLVE FOR b