SOLVING EXPRESSIONS DRILL

13. If $3x - y = 17$ and $2x - 2y = 6$, what is the value of $x + y$?

(A) 8
(B) 9
(C) 11
(D) 12
(E) 14

A. STACK!
$3x - y = 17$
$-\ 2x + 2y = 6$
B. SUBTRACT
$x + y = 11$

16. If $(x - y)^2 = 25$ and $xy = 10$, then what is $x^2 + y^2$?

A. FOIL
$x^2 - 2(xy) + y^2 = 25$
B. NOTICE xy
$x^2 - 2(10) + y^2 = 25$
$x^2 - 20 + y^2 = 25$
C. ADD 20 BOTH SIDES
$x^2 + y^2 = 45$

16. If $(a + b)^2 = 8^2$ and $a^2 + b^2 = 50$, what is ab?

(A) 14
(B) 10
(C) 9
(D) 8
(E) 7

A. NOTICE CLUE
B. SQUARE BOTH SIDES
$a^2 + 2ab + b^2 = 64$
C. NOTICE $a^2 + b^2 = 50$
$2ab + 50 = 64$
D. SUBT 50
$2ab = 14$
E. SOLVE FOR ab DIVIDE BY 2
$ab = \frac{14}{2} = 7$

15. If $p^2 - r^2 = 18$ and $p - r = 2$, what is $p + r$?

A. NOTICE CLUE
B. FACTOR
$(p + r)(p - r) = 18$
C. NOTICE $p - r = 2$
$(p + r)\,2 = 18$
$p + r = \frac{18}{2} = 9$

(A) 5
(B) 9
(C) 13
(D) 16
(E) 18

A. MAKE SURE ALL LIKE VARIABLES ARE STACKED
B. ADD TO GET RID OF Y AND Z

$x + 2y - 3z = 92$
$2x - y + z = 36$
$+\ 4x - y + 2z = 12$
$7x \qquad = 140$

19. Based on the system of equations above, what is the value of x?

C. SOLVE FOR x
$x = \frac{140}{7} = 20$

(A) 11
(B) 20
(C) –40
(D) –42
(E) It cannot be determined from the information given.

SLICK!

20. If $x + y = m$ and $x - y = n$, then what is $x^2 + y^2$, in terms of m and n?

A. NOTICE ALL VARIABLES AND NO NUMBERS
B. STACK!
$x + y = m$
$x - y = n$
C. PLUG IN YOUR OWN NUMBERS
$2 + 3 = 5$
$2 - 3 = -1$
C. NOW SOLVE $x^2 + y^2$
$2^2 + 3^2$
$4 + 9 = 13$
D. ONE OF THE ANSWERS MUST = 13 WHEN $m = 5$ AND $n = -1$
$\frac{m^2 + n^2}{2} = \frac{5^2 + (-1)^2}{2} = \frac{25 + 1}{2} = \frac{26}{2} = 13$
A MATCH!

(A) mn
(B) $\frac{m^2 + n^2}{2}$
(C) $(m - n)^2$
(D) $(m + n)^2$
(E) $\frac{m^2 - n^2}{2}$

13. $3x + 7y = 22$ and $2x + 6y = 12$, what is $13x + 13y$?

A. STACK!
$3x + 7y = 22$
B. SUBTRACT
$-\ 2x + 6y = 12$
$x + y = 10$
C. FACTOR
$13x + 13y$
$13(x + y)$
D. SOLVE
$13(10) = 130$

(A) 34
(B) 58
(C) 72
(D) 130
(E) 156

SLICK!

7. If $3x^2 = 4y = 12$, what is the value of x^2y?

A. BREAK IT UP
$3x^2 = 12 \qquad 4y = 12$
B. START SOLVING
$x^2 = \frac{12}{3} = 4 \qquad y = \frac{12}{4} = 3$
C. NOTICE x^2 AND y
$x^2 y = 4 \cdot 3 = 12$

(A) 48
(B) 36
(C) 24
(D) 12
(E) 6

SLICK!

14. If $(2x - 5)(2x + 5) = 5$, what is the value of $4x^2$?

A. FOIL
$(2x - 5)(2x + 5) = 5$
$4x^2 - 25 = 5$
B. ADD 25 TO BOTH SIDES
$4x^2 = 30$

(A) –30
(B) –20
(C) 10
(D) 20
(E) 30

16. If $3a + 4b = b$, which of the following must equal $6a + 6b$?

A. SUBTRACT b FROM BOTH SIDES
$3a + 4b = b$
$3a + 3b = 0$
B. FACTOR
$3(a + b) = 0$
C. SOLVE FOR $a + b$
$a + b = \frac{0}{3} = 0$
D. FACTOR QUESTION
$6a + 6b =$
$6(a + b) = 6(0) = 0$

(A) 0
(B) 12
(C) $2b$
(D) $12b$
(E) $6b - 8$

12. If $\frac{3x + y}{y} = \frac{6}{5}$, what is the value of $\frac{x}{y}$?

A. NOTICE $y = 5$ AND
$3x + 5 = 6$
$3x = 1$
$x = \frac{1}{3}$
B. SOLVE
$\frac{1}{3} \div \frac{5}{1} = \frac{1}{3} \cdot \frac{1}{5} = \frac{1}{15}$

10. If $(x + y)^2 = 100$ and $(x - y)^2 = 16$, what is the value of xy?

A. DISTRIBUTE AND STACK
$x^2 + 2xy + y^2 = 100$
$-\ x^2 - 2xy + y^2 = 16$
$4xy = 84$
B. SUBTRACT
$xy = 21$

OR A. SQUARE ROOT BOTH SIDES AND STACK
$x + y = 10$
$+\ x - y = 4$
$2x = 14$
$x = 7$
B. ADD THEN MULTIPLY
$y = 3$
$xy = 21$

(A) 6
(B) 10
(C) 21
(D) 25
(E) 29

SOLVING EXPRESSIONS DRILL

6. If $6x + 4 = 7$, what is the value of $6x - 4$?

(A) -7
(B) -1
(C) 1
(D) 7
(E) 8

A. PARTIAL SOLVE $6x+4=7$, $6x=3$
B. PLUG INTO QUESTION $6x-4=$ → $3-4=-1$
OR SOLVE FOR x THEN PLUG BACK IN TO QUESTION

5. If $\sqrt{3} = x + 1$, what is the value of $(x+1)^2$?

(A) $\sqrt{2}$
(B) $\sqrt{3}$
(C) 3
(D) 9
(E) 16

A. SQUARE BOTH SIDES $(\sqrt{3})^2=(x+1)^2$
B. NOTICE! $3=(x+1)^2$

12. If $x^2 - y^2 = 77$ and $x + y = 11$, what is the value of x?

A. RECOGNITION AND REACTION!
B. FACTOR $x^2-y^2=77$
C. PLUG IN $x+y=11$ → $(x+y)(x-y)=77$, $11(x-y)=77$
D. SOLVE FOR $x-y$: $x-y=7$
E. STACK AND ADD: $x+y=11$, $+\ x-y=7$, $2x=18$, $x=9$

3. If $x + 3 = a$, then $2x + 6 =$

(A) $a + 3$
(B) $a + 6$
(C) $2a$
(D) $2a + 3$
(E) $2a + 6$

A. REWRITE AND FACTOR $x+3=a$; $2x+6=2(x+3)=2(a)=2a$
B. PLUG IN $x+3=a$

14. If $4(x + y)(x - y) = 40$ and $x - y = 20$, what is the value of $x + y$?

A. PLUG IN $x-y=20$: $4(x+y)(20)=40$
B. SOLVE FOR $x+y$: $(x+y)80=40$, $x+y=\frac{40}{80}=\frac{4}{8}=\frac{1}{2}$ OR .5

5. If $\frac{x}{4} = \frac{2x}{a}$ and $x \neq 0$, what is the value of a?

(A) 8
(B) 4
(C) 2
(D) $\frac{1}{2}$
(E) $\frac{1}{4}$

A. NOTICE RATIOS. $x:2x$, $1:2$, so $4:a$, $a=8$

15. If $x^2 - y^2 = 10$ and $x + y = 5$, what is the value of $x - y$?

A. RECOGNITION AND REACTION
B. FACTOR $x^2-y^2=10$
C. PLUG IN $x+y=5$: $(x+y)(x-y)=10$, $5(x-y)=10$
D. SOLVE $x-y$: $x-y=\frac{10}{5}=2$

2. If $2x - 10 = 20$, then $x - 5 =$

(A) 5
(B) 10
(C) 15
(D) 20
(E) 30

A. FACTOR $2x-10=20$, $2(x-5)=20$
B. SOLVE FOR $x-5$: $x-5=\frac{20}{2}=10$

2. If $a(x + y) = 45$ and $ax = 15$, what is the value of ay?

(A) 3
(B) 5
(C) 15
(D) 25
(E) 30

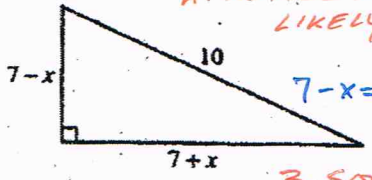
A. DISTRIBUTE $a(x+y)=45$, $ax+ay=45$
B. PLUG IN $ax=15$: $15+ay=45$
C. SUBTRACT 15 FROM BOTH SIDES: $ay=45-15=30$

8. If $2x + z = 2y$ and $2x + 2y + z = 20$, what is the value of y?

(A) 5
(B) 8
(C) 10
(D) 15
(E) It cannot be determined from the information given.

A. STACK LIKE TERMS (MOVE INSIDE)
$2x+2y+z=20$
$-\ 2x-2y+z=0$
$4y=20$
B. SUBTRACT
$y=5$

SLICK → WELCOME TO EXPRESSIONS/GEOMETRY COMBO



A. NOTICE RIGHT ANGLE LIKELY 3-4-5 RULE 6-8-10
$7-x=6$ $7+x=8$
$x=1$ $x=1$
B. SOLVE QUESTION $49+x^2=$ $49+(1)^2=$ $49+1=50$

Note: Figure not drawn to scale.

15. The figure above is a right triangle. What is the value of $49 + x^2$?

(A) 50
(B) 51
(C) 72
(D) 98
(E) 100