

Name:

Date:

Group Like Terms

When a number is multiplied by itself, it is called an exponent. Exponents have a base number and a small raised number called an exponent. There are a few rules you should be familiar with for the SHSAT using exponents.

GROUP LIKE TERMS: EXPONENT ADDITION and SUBTRACTION

When adding and subtracting exponents, we group the exponents with the same base & exponent, and add or subtract the coefficients.

“x squared”	$x^2 + x^2 = 2x^2$
“x cubed”	$2x^3 + 5x^3 = 7x^3$
“x to the fourth”	$3x^4 - 2x^4 = x^4$

When there are more than one variable in an expression, we add and subtract by variable group. When an expression has terms with different exponents, we sort the terms by power, then add or subtract:

GROUP LIKE TERMS: Variables by degree, Constants

Expression	1st Term	2nd Term	3rd Term	4th Term	Simplified
$3x + 2y + 2x + 5y$	$(3x + 2x)$	$(2y + 5y)$			$5x + 7y$
$a + b + c + 2a + 2b + 3c$	$(a + 2a)$	$(b + 2b)$	$(c + 3c)$		$3a + 3b + 4c$
$(x^2 + 5x - 9) + (7x - 11)$	(x^2)	$(5x + 7x)$	$(-9 - 11)$		$x^2 + 12x - 20$
$(x^3 + 6x + 1) + (6x^2 + 9x + 1)$	(x^3)	$(6x^2)$	$(6x + 9x)$	$(1 + 1)$	$x^3 + 6x^2 + 15x + 2$
$x^2 + y^2 + 2x^2 + 2y + 10$	$(x^2 + 2x^2)$	(y^2)	$(2y)$	(10)	$3x^2 + y^2 + 2y + 10$

You Try It:

<p>1) $(3a + 5b + 14c) + (2a + 7b + 7c) =$ _____</p> <p>2) $(x^2 + x - 6) + (10x - 6) =$ _____</p> <p>3) $4x^2 + 3y^2 + 3x^2 + 2y + 15 =$ _____</p>
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Name:

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Chang Learning

SHSAT Lesson #3: Group Like Terms

SHSAT Lesson #3 Classwork: Group Like Terms

1. $2x + 3y + 4x + 6y =$	A. $6x + 9y$ B. $15xy$ C. $30xy$ D. $9x + 6y$ E. $5x + 10y$
2. Teacher Josh starts the school year buying 4 boxes of pens that each have 12 pens. The school also gives him 6 extra boxes each with half a dozen. Also he has 5 extra pens on his desk. How many pens does Josh have total ?	A. 24 B. 48 C. 57 D. 89 E. 99
3. $(2x^3 + 7) - (2x^3 + 15) =$	A. $4x^3 + 22$ B. $4x^3 - 8$ C. $x^3 + 22$ D. 22 E. $- 8$
4. When $a = 3$, what is $(2a^2 + 7) - (a^2 + 9) + 5$?	A. 48 B. 24 C. 30 D. 12 E. $- 2$
5. Find $(2r^5 + 7) - 2(r^5 + 9)$ for when $r = 1$	A. 29 B. 20 C. $- 1$ D. $- 10$ E. $- 11$
6. $(a + b + c) + (5c + 2b + 3a) =$	A. $6a+3b+4c$ B. $11abc$ C. $31abc$ D. $4a+3b+6c$ E. $8ac+3b$

SHSAT Lesson #3: Classwork (EASY LEVEL)

7. $(x^2 - 6x + 9) + (15x + 11)$	A. $(x^2 + 21x + 9)$ B. $(x^2 + 6x + 20)$ C. $(x^2 + 9x + 20)$ D. $(x^2 + 9x + 99)$ E. $(x^2 - 90x + 99)$
8. Find the value of $(2^4 - 4^2) + (2^3 - 3^2)$	A. -11 B. -8 C. -1 D. 0 E. 1
9. $(x^2 - 3x + 2) + (6x - 12)$	A. $(x^2 - 3x - 10)$ B. $(x^2 + 9x - 10)$ C. $(x^2 + 9x - 14)$ D. $(x^2 + 3x + 10)$ E. $(x^2 + 3x - 10)$
10. Find: $(2y^2 + 7) - (2y^2 - 9) + (y - 1)$ when $x = 2$ and $y = 3x + 1$	A. 16 B. -16 C. -2 D. 22 E. 8
11. Simplify $(2c + 7) - (c + 9) + (4c - 1)$	A. $5c + 17$ B. $5c + 15$ C. $5c - 3$ D. $5c - 17$ E. $c - 3$
12. Calculate $4^3 - 4^2 + 4^3 - 4^2 =$	A. $6 * 4^2$ B. 4^2 C. 4^{12} D. 6^3 E. 36

SHSAT Lesson #3: Classwork (MID LEVEL)

<p>13. Simplify:</p> $3(n^2 + 7) - (2n^2 - 9) + 5(n - 1)$	<p>A. $n^2 + 5n + 30$ B. $n^2 + 5n + 35$ C. $n^2 + 5n + 7$ D. $6n^2 + 5n + 30$ E. $n^2 + 5n + 25$</p>
<p>14. Rewrite as a trinomial:</p> $5(2k^2 + 7) - 9(k^2 - 2) + 3(k - 1)$	<p>A. $k^2 + 3k + 47$ B. $-2k^2 + 3k + 50$ C. $-2k^2 + 3k + 47$ D. $k^2 + 3k + 50$ E. $2k^2 + 3k + 50$</p>
<p>15. Rosie is packing candles for a church fundraiser. She has 243 candles, and 15 candles will fill one box. How many candles will remain if she fills all the candle boxes to capacity ?</p>	<p>A. 1 extra B. 3 extra C. 6 extra D. 9 extra E. 14 extra</p>
<p>16. If Archie has “n” books and Betty has twice as many books as Archie. If Jughead has 5 less books than Betty, how many books do they have all together ?</p>	<p>A. $3n - 5$ B. $4n + 5$ C. $4n - 5$ D. $5n - 5$ E. $5n + 5$</p>
<p>17. After Richard gave 10% of his money to charity, he had \$180 left. How much money did he have originally ?</p>	<p>A. \$216 B. \$200 C. \$195 D. \$172 E. \$144</p>
<p>18. $(a - 1) - (a - 2) + (a - 3) =$</p>	<p>A. $-a + 4$ B. $a + 4$ C. $a - 6$ D. $a - 2$ E. $3a - 2$</p>

SHSAT Lesson #3: Classwork (CHALLENGE LEVEL)

<p>19. Distribute and Simplify:</p> $3(2g^2 + 7) - 2(g^2 + 9) - (7g^2 - 8)$	<p>A. $-3g^2 + 38$ B. $-3g^2 + 22$ C. $-3g^2 + 11$ D. $-3g^2 - 11$ E. $-3g^2 + 20$</p>
<p>20. If $a * b$ means a^b, then $2 * (3 * 2)$ is</p>	<p>A. 512 B. 256 C. 81 D. 64 E. 12</p>
<p>21. Simplify</p> $5x(2y^2 + 7x)$	<p>A. $(7xy^2 + 12x^2)$ B. $(10xy^2 + 12x^2)$ C. $(10xy^2 + 35x^2)$ D. $(10xy^2 + 35x)$ E. $(10y^2 + 35x)$</p>
<p>22. Distribute:</p> $-3x(7y - 5)$	<p>A. $21xy - 15x$ B. $-10xy + 8x$ C. $-21xy + 15x$ D. $10xy + 8x$ E. $4xy - 8x$</p>
<p>23. James is 3 times as old as Mary. In 10 years, he will then be seven years younger than twice her age. How old will Mary be in 15 years ?</p>	<p>A. 36 B. 24 C. 21 D. 19 E. 18</p>
<p>24. Billy earned a 94, 90, 86 and 84 on four math exams. What does he need to score on the 5th exam to have a 90 average ?</p>	<p>A. 98 B. 96 C. 92 D. 90 E. 88</p>

SHSAT Lesson #3: Classwork: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> <p>$(6x + 4y) + (2x + 3y) = ax + by$. What is $a + b$?</p>	Grid In
<p>26. (Easy Level)</p> <p>When $r = 3$, compute the value of $3(2r^3 + 7) - 2(r^3 + 15)$</p>	Grid In
<p>27. (Mid Level)</p> <p>David is three times older than Ethan, who is five years younger than his cousin Fred. If Fred is 16 years old, how old is David ?</p>	Grid In
<p>28. (Mid Level)</p> <p>What is the value of "x" given that</p> $6(x - 4) = 4(x - 1)$	Grid In
<p>29. (Challenge Level)</p> <p>The number of jellybeans in a jar is between 50 and 100. If the jellybeans are divided into 5 bags, then there are 3 leftover. If they are divided into 7 bags, then there is only 1 leftover. How many jellybeans are there ?</p>	Grid In
<p>30. (Challenge Level)</p> <p>$2^4 * 4^3 * 8^2 = 4^p$ then what is the value of variable p ?</p>	Grid In

SHSAT Lesson #3 Homework: Exponents

1. $4x + 3y + 7x + 9y =$	A. $12x + 11y$ B. $23xy$ C. $75xy$ D. $11x + 12y$ E. $28x + 27y$
2. Teacher Josh starts the school year buying 4 boxes of notebooks that each have 18 notebooks. The school also gives him 2 extra boxes each with half a dozen. Also he has 6 extra unused notebooks from last year. How many notebooks does Josh have total ?	A. 90 B. 88 C. 86 D. 84 E. 82
3. $(2x^3 + 7) - (2x^3 + 18) =$	A. $4x^3 + 25$ B. $4x^3 - 11$ C. $x^3 + 25$ D. 5 E. 11
4. When $a = 2$, what is $(2a^2 + 7) - (a^2 + 9) + 5$?	A. 15 B. 11 C. 7 D. 5 E. 3
5. Find $(2t^5 + 7) - 2(t^5 + 9)$ for when $t = 1$	A. 29 B. 20 C. -1 D. -10 E. -11
6. $(3a + 2b + 1c) + (4c + 5b + 6a) =$	A. $7a+7b+7c$ B. $9a+7b+5c$ C. $5a+7b+9c$ D. $7a+9b+5c$ E. $12a+10b+6c$

SHSAT Lesson #3: Homework (EASY LEVEL)

7. $(x^2 - 6x + 9) + (15x + 11)$	A. $(x^2 + 21x + 9)$ B. $(x^2 + 6x + 20)$ C. $(x^2 + 9x + 20)$ D. $(x^2 + 9x + 99)$ E. $(x^2 - 90x + 99)$
8. Find the value of $(2^4 - 4^2) + (2^3 - 3^2)$	A. -11 B. -8 C. -1 D. 0 E. 1
9. $(x^2 - 11x + 28) + (13x - 43)$	A. $(x^2 - 2x - 25)$ B. $(x^2 + 2x - 25)$ C. $(x^2 + 2x - 15)$ D. $(x^2 + 24x + 15)$ E. $(x^2 + 24x - 15)$
10. Find: $(2y^2 + 7) - (2y^2 - 9) + (y - 1)$ when $x = 4$ and $y = 2x + 1$	A. 16 B. -16 C. -4 D. 24 E. 6
11. Simplify $(2m + 7) - (m + 9) + (4m - 1)$	A. $5m + 17$ B. $5m + 15$ C. $5m - 3$ D. $5m - 17$ E. $m - 3$
12. Calculate $5^3 - 5^2 + 5^3 - 5^2 =$	A. $8 * 5^2$ B. 5^2 C. 5^{12} D. 10^3 E. 100

SHSAT Lesson #3: Homework (MID LEVEL)

<p>13. Simplify:</p> $3(n^2 + 7) + (2n^2 - 9) - 5(n - 1)$	<p>A. $n^2 + 5n + 17$ B. $5n^2 + 5n + 17$ C. $5n^2 + 5n + 7$ D. $5n^2 - 5n + 17$ E. $5n^2 - 5n - 7$</p>
<p>14. Rewrite as a trinomial:</p> $5(2r^2 + 7) - 9(r^2 - 2) + 3(r - 1)$	<p>A. $r^2 + 3r + 47$ B. $-2r^2 + 3r + 50$ C. $-2r^2 + 3r + 47$ D. $r^2 + 3r + 50$ E. $2r^2 + 3r + 50$</p>
<p>15. Jimmy is packing food bags for a weekly church charity. He has 280 slices of bread, and each bag gets 12 slices of bread. How many slices will remain if he fills all the bags to capacity ?</p>	<p>A. 2 extra B. 4 extra C. 6 extra D. 8 extra E. 10 extra</p>
<p>16. If Richie has “n” books and Casper has thrice as many books as Richie. If Elmer has 5 less books than Casper, how many books do they have all together ?</p>	<p>A. $3n - 5$ B. $6n + 5$ C. $6n - 5$ D. $7n - 5$ E. $7n + 5$</p>
<p>17. After Isaac gave 15% of his money to charity, he had \$255 left. How much money did he have originally ?</p>	<p>A. \$360 B. \$300 C. \$270 D. \$420 E. \$450</p>
<p>18. $(a - 1) - (a - 2) + (a - 3) =$</p>	<p>A. $-a + 4$ B. $a + 4$ C. $a - 6$ D. $a - 2$ E. $3a - 2$</p>

SHSAT Lesson #3: Homework (CHALLENGE LEVEL)

<p>19. Distribute and Simplify:</p> $3(2w^2 + 7) - 2(w^2 + 9) - (7w^2 - 8)$	<p>A. $-3w^2 + 38$ B. $-3w^2 + 22$ C. $-3w^2 + 11$ D. $-3w^2 - 11$ E. $-3w^2 + 20$</p>
<p>20. If $a * b$ means a^{b-1}, then $4 * (2 * 3)$ equals</p>	<p>A. 512 B. 256 C. 128 D. 64 E. 16</p>
<p>21. Simplify</p> $5a(2b^2 + 7a)$	<p>A. $(7ab^2 + 12a^2)$ B. $(10ab^2 + 12a^2)$ C. $(10ab^2 + 35a^2)$ D. $(10ab^2 + 35a)$ E. $(10b^2 + 35a)$</p>
<p>22. Distribute:</p> $-3x(5y + 1)$	<p>A. $-3x - 15xy$ B. $-15xy + 3x$ C. $-8xy - 3x$ D. $15xy + 3x$ E. $2xy - 3x$</p>
<p>23. George is 5 times as old as Ivan. In 10 years, he will then be four years younger than twice his age. How old will Ivan be in 12 years ?</p>	<p>A. 28 B. 24 C. 20 D. 16 E. 14</p>
<p>24. Samson earned a 82, 92, 84 and 96 on four math exams. What does he need to score on the 5th exam to have a 90 average ?</p>	<p>A. 98 B. 96 C. 92 D. 90 E. 88</p>

SHSAT Lesson #3: Homework: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> <p>$(16x + 8y) + (-5x + 7y) = ax + by$. What is $a + b$?</p>	Grid In
<p>26. (Easy Level)</p> <p>With $a = 7$, compute the value of $(4a^2 + 17) - (3a^2 + 9) + 15$</p>	Grid In
<p>27. (Mid Level)</p> <p>A bowl has 9 red, 7 blue and 4 green marbles. Then 3 red marbles are added, 2 blue marbles are removed, and 6 green marbles are added. What fraction of the marbles are now red ?</p>	Grid In
<p>28. (Mid Level)</p> <p>What is the value of "x" given that $3(x - 4) = 7(x - 12)$</p>	Grid In
<p>29. (Challenge Level)</p> <p>The number of jellybeans in a jar is between 50 and 100. If the jellybeans are divided into 5 bags, then there are 2 leftover. If they are divided into 7 bags, then there is only 5 leftover. How many jellybeans are there ?</p>	Grid In
<p>30. (Challenge Level)</p> <p>Xavier is the youngest of 3 friends. He is 4 years old. Yuki is 7 years older than twice Xavier's age. Zoe is 8 years younger than Yuki's age 12 years from now. How old is Zoe ?</p>	Grid In

JW2542 for Chang Learning 2023 (Set F)