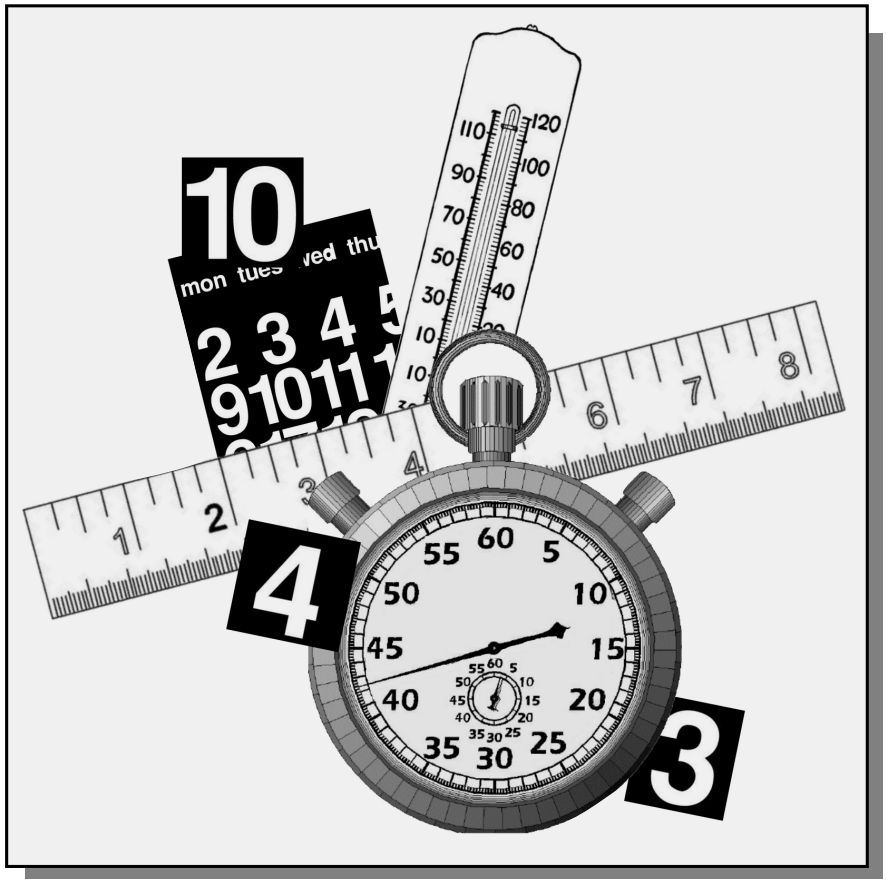
Intermediate Math Skills

Activities



Chapter 6

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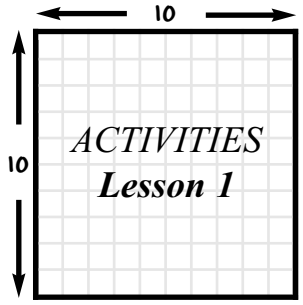
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Algebra

Multiply Polys

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Polynomials can be _____ as well as being added and subtracted.

2. Professor K multiplies _____ times monomials, binomials and trinomials.

Refer to Example Set 1 to answer questions 3-9.

3. In part a) the two monomials multiplied are _____ and _____.

4. Professor K multiplies two monomials by using the _____ to rearrange the numbers and variables.

5. $x \bullet x =$ _____ $\bullet\ x^1 = x^{1+1} = x^2$

6. In part b), the three monomials are _____.

7. Professor K multiplies these three monomials by using the _____ _____ to rearrange the numbers and variables.

8. $2x(15y)(3x^2) = (2 \bullet$ _____ $\bullet\ 3)(x \bullet x^2)(y)$

9. $x \bullet x^2 = x^1 \bullet x^2 =$ _____ $= x^3$

Multiply the following monomials. Show your work and write your answers on the blanks.

10. $4x(2x) =$ _____

(a) $6x$ (b) $8x$ (c) $6x^2$ (d) $8x^2$

11. $11z(10z) =$ _____

12. $7a(6a^2) =$ _____

(a) $13a^3$ (b) $42a^3$ (c) $42a^2$ (d) can't be done

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13. $2x(2x)(2x) =$ _____

14. $3y(4y)(2y) =$ _____

15. $2z(4z^2)(3z^3) =$ _____

Refer to Example Set 2 to answer questions 16-24.
In part a):

16. The monomial in this problem is _____.

17. The binomial in this problem is _____.

18. Professor K _____ the multiplier ($6x$) by multiplying each term of the binomial within the parentheses.

19. $6x(5x - 7) =$ _____ $\bullet\ 5x - 6x \bullet 7$

20. $6x \bullet 5x - 6x \bullet 7 = (6 \bullet 5)(x \bullet x) -$ (_____)x

In part b):

21. $2x(2x + 3) = 2x \bullet 2x +$ _____ $\bullet\ 3$

22. $2x \bullet 2x + 2x \bullet 3 =$ (_____)$(x \bullet x) + (2 \bullet 3)x$

23. $(2 \bullet 2)(x \bullet x) + (2 \bullet 3)x =$ _____

24. In c), $x \bullet x =$ _____.

Multiply the following monomials and binomials. Show your work and write your answers on the blanks (25-29).

25. $4x(2x + 1) =$ _____

26. $8x(x + 5) =$ _____

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27. $2x(x + 5)$ = _____

28. $2x(x^2 + 3x)$ = _____

29. $3x(2x^2 + 4x)$ = _____

30. The _____ is used to multiply a monomial by a binomial.

Refer to Example Set 3 to answer questions 31-33.

31. The trinomial factor is _____.

32. In Step 1, Professor K distributes the _____ within the parentheses.

33. Professor K multiplies _____ by each term of the trinomial.

Multiply the following monomials and trinomials. Show your work and write your answers on the blanks.

34. $2x(2a + 3b + 4c)$ = _____

35. $3x(4a + 2b + 8c)$ = _____

36. $5a(2a + 10b + 6c)$ = _____

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37. $2x(5a + 12b + 8c) =$ _____

38. $x(2x^2 + 12x + 8) =$ _____

39. Extend what you have learned about multiplying polynomials to multiply a monomial by a polynomial of four terms. $2x(3a + 2b + 5c - 4d) =$ _____

(a) $5xa + 4xb + 7xc - 2xd$

(b) $6xa + 4xb + 10xc - 2xd$

(c) $6xa + 4xb + 10xc - 8xd$

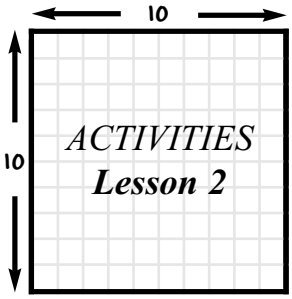
(d) $6xa + 4xb - 10xc - 8xd$

40. Write the **Life Principle**: "_____
_____."

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Name: _____

Date: _____ Grade: _____





Algebra

FOIL

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. _____ means bringing or putting together.

2. When you do not follow directions, you usually make _____.

3. You should always follow _____.

4. Certain procedures should be accomplished _____, before other procedures.

5. The acronym for the Order of Operations, Please Excuse My Dear Aunt Sally, is _____.

6. An important procedure that orders the way you multiply polynomials is noted by the acronym _____, which means First, Outer, Inner, Last.

7. Professor K multiplies the binomials, $(2x + 1)$ and $(3x + 2)$ using the method called _____.

8. The First terms are _____ and _____.

9. The Outer terms are _____ and ____.

10. The Inner terms are _____ and ____.

11. The Last terms are _____ and _____.

12. In the final step of ***FOIL***, Professor K _____ like terms.

Refer to Example Set 2 to answer questions 13-18.

13. The product of the First terms is _____.

14. The Outer terms are _____ and ____.

15. The product of the Inner terms is _____.

16. The Last terms are ____ and _____.

17. Negative times negative = _____.

18. The product of the two binomials, $(6x - 1)(5x - 7)$ is _____.

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Refer to Example Set 3 to answer questions 19-23.

19. In this example, the binomials contain different operation _____.

20. Professor K multiplies the First terms of the two binomials. ____ • _____ =
$(3 \bullet 3)(x^1 \bullet x^1) = 9x^{1+1} = 9x^2$.

21. Professor K multiplies the Outer terms of the two binomials. $3x \bullet 4$ = _____.

22. Professor K multiplies the Inner terms of the two binomials. ____ • _____ = $-3x$.

23. Professor K multiplies the Last terms of the two binomials. _____ • _____ = _____.

Multiply the following binomials using FOIL. Show your work and write your answers on the blanks.

24. $(2x + 1)(3x + 4)$ =_____
First $2x \bullet 3x$ = _____
Outer $2x \bullet 4$ = _____
Inner $1 \bullet 3x$ = _____
Last $1 \bullet 4$ = _____
First _____+ Outer _____+ Inner _____ + Last _____ = _____

25. $(10x + 2)(x + 2)$ = _____
First ___ • ____ = _____
Outer ___ • ____ = _____
Inner ___ • ____ = _____
Last _____ • ____ = _____
First _____+ Outer _____+ Inner _____ + Last _____ = _____

26. $(x + 1)(x + 4)$ = _____
(a) $x + 5$ (c) $x^2 + 4$
(b) $x^2 + 5$ (d) $x^2 + 5x + 4$

27. $(4x + 5)(3x - 1)$ = _____
(a) $12x^2 + 11x - 5$ (c) $7x + 4$
(b) $12x^2 - 5$ (d) $7x^2 + 11x - 5$

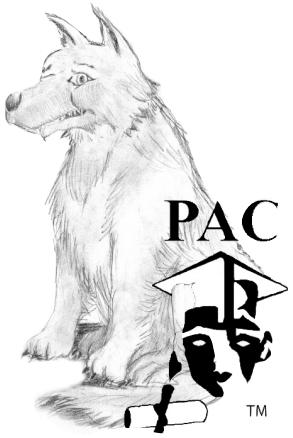
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28. $(11x - 2)(2x + 5)$ = _____

29. $(5x + 9)(2x - 2)$ = _____

30. Write the **Life Principle**: "_____
_____."

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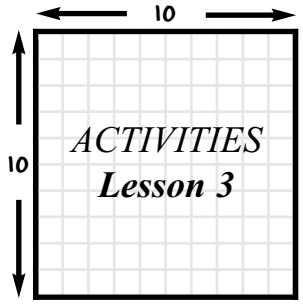


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Algebra

More FOIL



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A person is ***promoted*** to positions of greater _____ after he has proven himself with lesser ***responsibilities*** or tasks.

2. In life you must be _____ to take care of little things, so that you can be trusted with bigger, more important things.

3. FOILing the multiplication of two binomials is really a form of the _____.

Refer to Example Set 1 to answer questions 4-9.

4. In Step 1, Professor K distributes each term of the first binomial to the second binomial, ____$(3x + 2)$ + ____$(3x + 2)$.

5. In Step 2, Professor K distributes the terms in front of the binomial into the parentheses, $[2x($____$) + 2x(2)] + [1($____$) + 1(2)]$.

6. In Step 3, Professor K arranges the numbers and variables within the square brackets for multiplication, $[(2 \bullet$ ____$)(x \bullet x) + (2 \bullet 2)x] + [(1 \bullet$ ____$)x + (1 \bullet 2)]$

7. In Step 4, Professor K performs the multiplications within the parentheses contained within the _____ brackets.

8. In Step 5, Professor K adds _____ terms.

9. The product of the two binomials, $(2x + 1)$ and $(3x + 2)$ is _____.

Multiply the following binomials using the Distributive Property. Show your work and write your answers on the blanks (10-15).

Multiply: $(2x + 3)(4x + 5)$

10. $(2x + 3)(4x + 5)$ = ____$(4x + 5)$ + ____$(4x + 5)$

11. $2x(4x + 5) + 3(4x + 5)$ =____$(4x) + 2x(5)$ + ____$(4x) + 3(5)$

12. $2x(4x) + 2x(5) + 3(4x) + 3(5) = 2x \bullet 4x + 2x \bullet$ ___ $+ 3 \bullet$ ____ $+ 3 \bullet 5$

13. $2x \bullet 4x + 2x \bullet 5 + 3 \bullet 4x + 3 \bullet 5 =$ ___$x^2 + 10x +$ ___$x + 15$

14. $8x^2 + 10x + 12x + 15 = 8x^2 +$ _____$x + 15$

15. $(2x + 3)(4x + 5)$ = _____

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Multiply the following binomials and put the correct answer on the blanks for #16-19. Show your work.

16. Multiply: $(4x + 4)(2x + 7) =$ _____

17. Multiply: $(x + 4)(7x + 3) =$ _____

18. Multiply: $(9x + 3)(2x + 1) =$ _____

19. Multiply: $(2x + 10)(3x + 1) =$ _____

Refer to Example Set 2 to answer questions 20-24.

20. From Step 1, $(2x - 5)(2a - b + 4c) =$ _____$(2a - b + 4c) -$ ____$(2a - b + 4c)$.

21. In Step 1, Professor K distributes the terms in the binomial into the _____.
(a) monomial (b) binomial (c) trinomial

22. In Step 3, Professor K arranges the numbers and variables within the square brackets for multiplication,
$[(2 \bullet 2)(___ \bullet a) - 2(____ \bullet b) + (2 \bullet 4)(____ \bullet c)] - [(5 \bullet 2)a - 5b + (5 \bullet 4)c]$.

23. $- [10a - 5b + 20c] =$ ___ $10a$ ___ $5b$ ___ $20c$.

24. The negative sign in front of the square brackets in #23 changes _____ of the signs within the square brackets.
(a) some (b) most (c) all (d) none

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Multiply: (x + 3)(4a + 5b - c) for numbers 25-28.

25. (x + 3)(4a + 5b - c) = (_____)(4a) + (_____)(5b) - (_____)(c)

26. (x + 3) (4a) + (x + 3) (5b) - (x + 3) (c) = x(4a) + 3(4a) + _____(5b) + 3(5b) - x(c) - 3(___)

27. x(4a) + 3(4a) + x(5b) + 3(5b) - x(c) - 3(c) = __xa + 12a + ___xb + 15b - xc - 3c

28. (x + 3)(4a + 5b - c) = _____

Show your work as you multiply each binomial by each trinomial (29-32).

29. Multiply: (2x + 1)(3a + 2b + 3) = _____

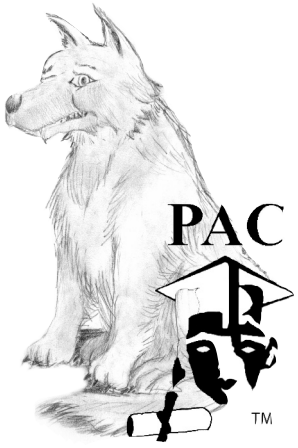
30. Multiply: (4x + 2)(a + b + c) = _____

31. Multiply: (x + 1)(3a + 2b - 3c) = _____

32. Multiply: (5x + 1)(2a + 5b - 2c) = _____

33. Write the **Life Principle**: "_____
_____."

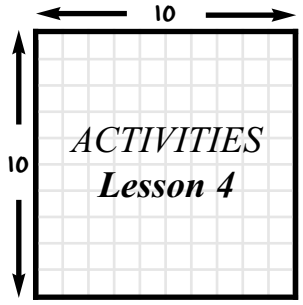
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Name: _____

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Algebra

Divide Polys

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Many problems are solved, by dividing the problems into _____ problems.

2. Division of polynomials can be accomplished by writing the division problem as a(n) _____.

3. The larger ***fraction*** is then divided into _____ fractions.

4. Professor K uses the _____ of fractions to ***accomplish*** the division of polynomials.

5. Professor K changes division problems into fractions to determine the _____.

Refer to Example Set 1 to answer questions 6-11.

6. $(2x^2 + 2x) \div 2x =$ _____ (fraction, Step 1)

7. $\frac{2x^2+2x}{2x} =$ _____ + _____ (Step 2)

8. $2x^2 = 2($____ • ____$)$ (Step 3)

9. $^2/_2 =$ _____

10. $^x/_x =$ _____

11. $^{2x}/_{2x} =$ _____

Complete the following division problem using the reduction of fractions. Show your work and write your answers on the blanks (12-15).

12. $(3x^2 + 2x) \div x =$ _____

$\frac{3x^2+2x}{x} = \frac{=}{x} + \frac{=}{x} =$ $\frac{3 \bullet x \bullet \cancel{x}}{\cancel{x}} + \frac{2 \bullet \cancel{x}}{\cancel{x}} =$ ____ $x +$ _____

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13. $(6x^3 + 4x) \div 2x =$ _____

14. $(25x^2 + 5x) \div 5x =$ _____

15. $(16x^4 + 12x^3) \div 4x^3 =$ _____

Refer to Example Set 2 to answer questions 16-21.

16. $(24x^3 - 40x^2 + 16x) \div (4x) =$ _____ (fraction, Step 1)

17. $\frac{24x^3 - 40x^2 + 16x}{4x} = \frac{_}{4x} - \frac{_}{4x} + \frac{_}{4x}$ (Step 2)

18. The factorization of $40x^2$ is $10 \bullet$ ____ $\bullet\ x \bullet$ ___. (Step 3)

19. $^4/_4 =$ _____

20. $^x/_x =$ _____

21. $(24x^3 - 40x^2 + 16x) \div (4x) =$ _____ (final answer)

Divide the following trinomials by the monomials (22-24).

22. $(2x^4 - 4x^2 + 8) \div (2) =$ _____

(a) $4x^4 - 8x^2 + 16$ (c) $2x^2 - 4x + 8$

(b) $x^4 - 2x^2 + 4$ (d) $x^2 - 2x + 4$

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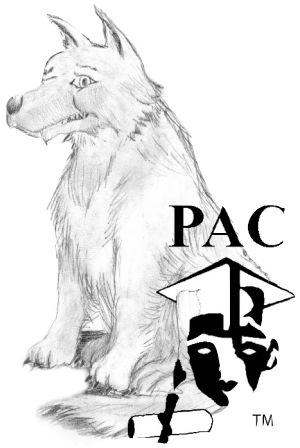
23. $(25x^3 + 20x^2 + 10x) \div (5x) =$ _____

(a) $5x^2 + 4x$ (c) $20x^2 + 15x + 5$
(b) $5x^3 + 4x^2 + 2x$ (d) $5x^2 + 4x + 2$

24. $(12x^4 + 9x^3 + 15x^2) \div (3x^2) =$ _____

25. Write the **Life Principle**: "_____
_____."

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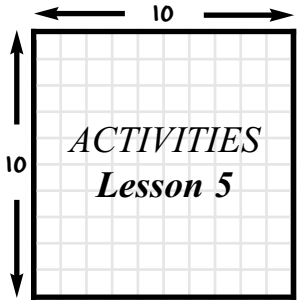


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Algebra

Long Division Polys



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Most cultures have _____.

2. A(n) _____ is a time-honored practice.

3. To _____ means to say.

4. ***Heritage*** means _____
_____.

5. Polynomials can also be divided in the traditional way by using _____ division.

Refer to Example Set 1 to answer questions 6-10.

6. The divisor in this problem is _____.

7. The _____ is the number of equal groups into which the dividend is divided.

8. The _____ is the number being divided into equal parts.

9. The quotient of 246 ÷ 2 is _____.

10. The answer to a division problem is called a(n) _____.

Use long division to calculate the quotient. Show your work and write your answers on the blanks.

11. 393 ÷ 3 = _____

12. 222 ÷ 2 = _____

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13. $625 \div 5 =$ _____

Refer to Example Set 2 to answer questions 14-18.

14. The dividend in this example is _____.

15. In Step 2, Professor K looks at the _____ term, $2x$ of the polynomial under the table top.

16. $^{2x}/_{2} =$ _____

17. Professor K places an x in the _____ row above the tabletop.

18. The quotient of $(2x + 4) \div 2$ is _____.

Determine the quotient of each of the following polynomials. Show your work.

19. $(3x + 9) \div 3 =$ _____

(a) $4x$ (b) $x + 9$ (c) $9x$ (d) $x + 3$

20. $(4x + 28) \div 4 =$ _____

21. $(7x - 14) \div 7 =$ _____

Refer to Example Set 3 to answer questions 22-25.

22. The dividend in this example is _____.

23. The divisor is _____.

24. $^{24x^3}/_{4x} =$ _____

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25. Professor K determined through long division that the quotient of $(24x^3 - 40x^2 + 16x)$ and $(4x)$ is _____.

Determine the quotient of each of the following polynomials.

26. $(10x^3 - 20x^2 + 30x) \div (10x)$ = _____

(a) $x^3 - 2x^2 + 3x$ (c) $x^2 - 2x + 3$

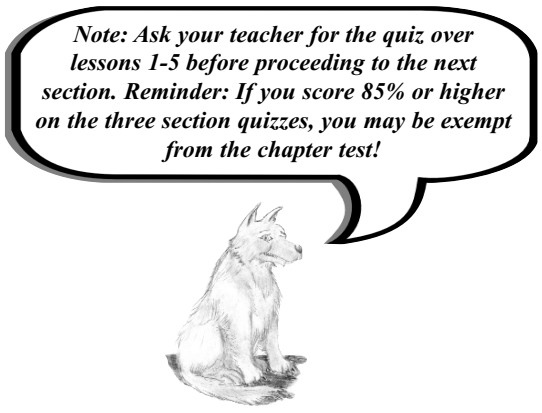
(b) $x^2 + 2x + 3$ (d) $100x^4 - 200x^3 + 300x^2$

27. $(8x^3 + 8x^2 + 8x) \div (8x)$ = _____

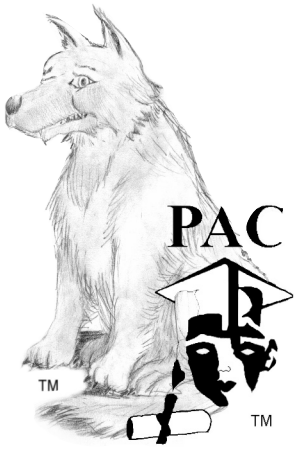
28. $(26x^4 + 13x^3 - 39x^2) \div (13x^2)$ = _____

29. Use the same steps in Example Set 3 to determine the quotient of $(6x^3 + 8x^2 + 12x - 4) \div (2)$. _____

30. Write the **Life Principle**: "_____ _____."



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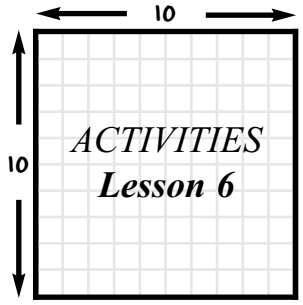


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Algebra

Long Division Remains



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Sometimes the quotient in a division problem contains a(n) _____.

Refer to Example Set 1 to answer questions 2-5.

2. The divisor in this problem is _____.

3. The dividend in this problem is _____.

4. The remainder after division is _____.

5. Professor K expresses the remainder as the fraction, _____.

Refer to Example Set 2 to answer questions 6-9.

6. The divisor in this problem is _____.

7. The dividend in this problem is _____.

8. The remainder after division is _____.

9. Professor K expresses the remainder as the fraction, _____.

Refer to Example Set 3 to answer questions 10-13.

10. The divisor in this problem is _____.

11. The dividend in this problem is _____.

12. The remainder after division is _____.

13. Professor K expresses the remainder as the fraction, _____.

Determine the following quotients using long division. Show your work and write your answers on the blanks. (Refer to Example Set 1)

14. 776 ÷ 7 = _____

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15. $9899 \div 9 =$ _____

16. $3233 \div 3 =$ _____

Refer to Example Set 2 for questions 17-19.

17. $(3x + 4) \div 3 =$ _____

18. $(5x + 23) \div 5 =$ _____

19. $(8x + 11) \div 8 =$ _____

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Refer to Example Set 3 for questions 20-24.

20. $(2x^2 + 4x + 11) \div 2$ _____

21. $(6x^2 + 36x + 3) \div 6x =$ _____

22. $(14x^3 + 14x^2 + 8x) \div 7x =$ _____

23. Determine the remainder in the quotient of the following division problem:

$(20x^2 + 40x + 8) \div 10x =$ _____.

(a) $^{5}/_{4x}$ (b) $^{5x}/_{4}$ (c) $^{4x}/_{5}$ (d) $^{4}/_{5x}$

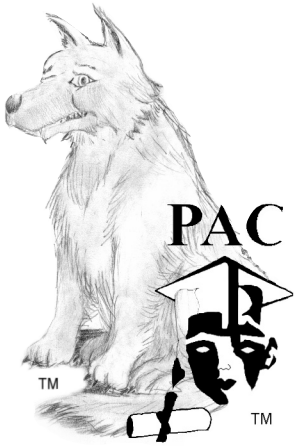
24. Determine the remainder in the following division problem:

$(5x^3 + 10x^2 + 20x + 13) \div 5x =$ _____.

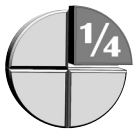
(a) $^{13}/_{5}$ (b) $^{13}/_{5x}$ (c) $^{5x}/_{13}$ (d) no remainder

25. Write the **Life Principle**: "_____
_____."

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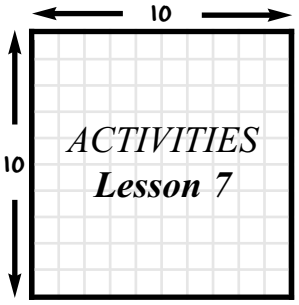


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Fractions

Complex Fractions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Many problems in life are _____.

2. _____ means consisting of many complicated or interrelated parts.

3. _____ was the President of the United States during the World Trade Center attack.

4. The decisions during times of crisis must be well _____.

5. To ***retaliate*** is to _____ for wrongs suffered.
(a) pay back in like manner (b) pay in advance (c) withhold pay

6. The United States wanted the _____ of other world powers.

7. ***President G. W. Bush*** had to plan very carefully the course that the United States would take. _____ (a) True or (b) False

8. You should take bigger, more complex problems one _____ step at a time.

Refer to Example Set 1 to answer questions 9-13.

9. The fractions contained in the addition and subtraction problems contain _____ denominators.

10. When multiplying, the _____ do not have to be the same as with addition and subtraction.

11. To multiply fractions you must place the product of the numerators _____ the product of the denominator.

12. To divide fractions you must first _____ (flip) the fraction to the right of the division operation symbol.

13. The ***reciprocal*** of $\frac{6}{7}$ is _____.

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Perform the indicated operations (14-21).

14. $\frac{4}{9}+\frac{3}{9}=$ _____

15. $\frac{1}{4}+\frac{2}{4}=$ _____

16. $\frac{8}{9}-\frac{3}{9}=$ _____

17. $\frac{13}{15}-\frac{5}{15}=$ _____

18. $\frac{2}{4}\bullet\frac{4}{5}=$ _____

19. $\frac{5}{6}\bullet\frac{5}{6}=$ _____

20. $\frac{2}{5}\div\frac{3}{7}=$ _____

21. $\frac{9}{13}\div\frac{4}{13}=$ _____

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22. A complex fraction is a fraction that contains a(n) _____ in either or both, the numerator or denominator.

Refer to Example Set 2 to answer questions 23-27.

23. Fractions are another way to represent _____.

24. In Step 1, Professor K represents the fraction as a(n) _____ problem.

25. In Step 2, 2 becomes _____.

26. In Step 2, Professor K inverted the $^{2}/_{1}$ to make it _____.

27. After inverting the $^{2}/_{1}$, Professor K calculates the answer by _____ the numerators together and the denominators together.

Simplify the following complex fractions.

28. $\dfrac{1/4}{3}$ = _____

(a) $^{3}/_{4}$ (b) $^{4}/_{3}$ (c) $^{1}/_{7}$ (d) $^{1}/_{12}$

29. $\dfrac{7/9}{2}$ = _____

(a) $^{7}/_{18}$ (c) $1^{5}/_{9}$ (e) $2^{4}/_{7}$ (g) d or e
(b) $^{14}/_{9}$ (d) $^{18}/_{7}$ (f) b or c (h) none of these

Refer to Example Set 3 to answer questions 30-32.

30. The complex fraction contains a fraction in the _____.

31. Professor K flips or inverts the fraction, _____.

32. The resulting reciprocal is $^{3}/_{1}$ or _____.

Simplify the following complex fractions (33-34).

33. $\dfrac{7}{1/7}$ = _____

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34. $\dfrac{15}{1/7}$ = _____

35. In Example Set 4, Professor K shows you how to simplify a complex fraction containing a fraction in _____ the numerator and denominator.

Refer to Example Set 4 to answer questions 36-40.

36. In Step 1, Professor K changes the complex fraction into a _____ problem.

37. Professor K _____ the fraction, $^1/_4$.

38. The resulting _____ is $^4/_1$.

39. $\dfrac{2}{7} \bullet \dfrac{4}{1} = \dfrac{2 \bullet _____}{7 \bullet 1} = \dfrac{8}{7}$

40. $\dfrac{8}{7}$ = _____

Simplify the following complex fractions.

41. $\dfrac{4/1}{3/5}$ = _____

(a) $^{12}/_5$ (c) $2^2/_5$ (e) $^{12}/_5$ (g) a or c

(b) $^{20}/_3$ (d) $6^2/_3$ (f) b or d (h) none of these

42. $\dfrac{3/4}{1/11}$ = _____

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43. $\dfrac{9/10}{2/3}$ = _____

44. $\dfrac{11/15}{2/8}$ = _____

45. $\dfrac{3/10}{4/22}$ = _____

46. $\dfrac{1/4}{2/3}$ = _____

47. $\dfrac{3/22}{1/3}$ = _____

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48. $\dfrac{7/10}{3/11}$ = _____

49. $\dfrac{8/15}{16/15}$ = _____

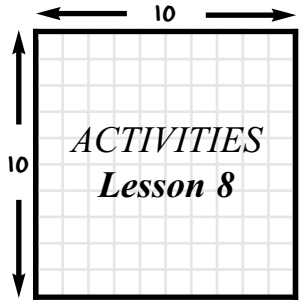
50. Write the **Life Principle**: "_____
_____."

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Algebra

Variable Fractions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The ***outcome*** of the situation may change, depending on what you do. _____
(a) True or (b) False

2. How you deal with a problem, is one of the _____ in problem solving.

3. Professor K sees every problem in life as a challenge and a(n) _____ for success.

4. In this lesson, Professor K simplifies complex fractions containing _____.

5. Example Set 1 shows you how to perform the _____ mathematical operations on fractions containing variables.

Refer to Example Set 1 to answer questions 6-19.

6. Fractions with the same (_____) denominators may be added or subtracted by placing the sum or difference of the numerators over the denominator.

7. In a), the sum of the numerators is $x + 2$ because _____ and _____ cannot be combined when adding.

8. In b), fractions with like denominators were subtracted by placing the _____ of the numerators over the denominator.

9. Since _____ and _____ cannot be combined when subtracting, the numerator remains a mathematical expression.

10. In c), $x \bullet 6 = 6 \bullet x = 6x$, because numbers and letters *can* be combined in _____ to form one term.

11. To divide fractions, you must first invert the divisor (the fraction to the right of the division operation symbol) and then _____.

12. $\frac{x}{10} + \frac{6}{10} =$ _____

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13. $\frac{7}{8}+\frac{x}{8}=$ _____

14. $\frac{x}{25}-\frac{8}{25}=$ _____

15. $\frac{45}{100}-\frac{x}{100}=$ _____

16. $\frac{x}{3}\bullet\frac{4}{7}=$ _____

17. $\frac{2}{5}\bullet\frac{x}{3}=$ _____

18. $\frac{x}{16}\div\frac{5}{3}=$ _____

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19. $\frac{25}{2} \div \frac{x}{3} =$ _____

20. _____ fractions that contain variables are simplified using the same _____ as numerical complex fractions.

Refer to Example Set 2 to answer questions 21-24.

21. Professor K is simplifying a(n) _____ expression.
(a) simple (b) complex (c) complex numerical (d) algebraic

22. An algebraic expression is an expression that contains a(n) _____ or unknown.

23. By changing the division problem to multiplication, Professor K determined that the reciprocal of x is _____.

24. $\frac{3 \bullet 1}{4 \bullet x} =$ _____

Simplify the following algebraic expressions. Show your work. Put your answers on the blanks.

25. $\frac{1/4}{x} =$ _____
(a) $1/4x$ (b) $4x$ (c) $1/4x$ (d) 1

26. $\frac{3/8}{x} =$ _____

27. $\frac{2/7}{x} =$ _____

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28. $\dfrac{3/5}{x}$ = _____

Refer to Example Set 3 to answer questions 29-30.

29. In this example, the variable is in the _____.

30. The reciprocal of $1/3$ is _____.

Simplify the following complex fractions.

31. $\dfrac{x}{2/5}$ = _____

(a) $2/5x$ (b) $5x/2$ (c) $2x/5$ (d) $2x$

32. $\dfrac{x}{3/8}$ = _____

33. $\dfrac{x}{7/11}$ = _____

34. $\dfrac{x}{1/12}$ = _____

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Refer to Example Set 4 to answer questions 35-37.

35. This complex problem contains a _____ in both the numerator and denominator.

36. The reciprocal of $^{x}/_{4}$ is _____.

37. $\frac{2}{3} \div \frac{x}{4} = \frac{2}{3} \bullet \frac{4}{x} = \frac{2 \bullet 4}{3 \bullet x} =$ _____

Simplify the following complex fractions.

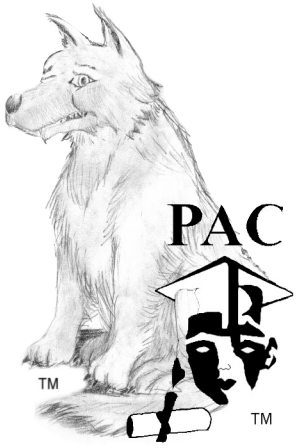
38. $\frac{3/4}{7/x} =$ _____

(a) $^{3}/_{28x}$ (b) $^{28}/_{3x}$ (c) $^{3x}/_{28}$ (d) $^{28x}/_{3}$

39. $\frac{8/9}{x/10} =$ _____

40. Write the **Life Principle**: "_____ _____."

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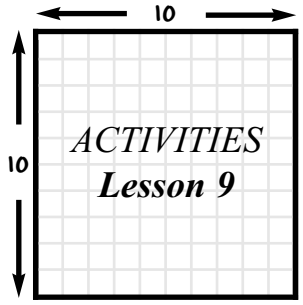
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Date: _____ Grade: _____



Algebra

Complex Variables



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Professor K uses the Distributive Property in this lesson to simplify _____ fractions.

2. Remember, mathematics is similar to _____.

3. You must follow certain _____ to solve problems in mathematics and in life.

4. You must also draw from previous _____ and experiences to determine solutions to new problems.

Refer to Example Set 1 to answer questions 5-9.

5. The problem consists of the _____ of two fractions containing algebraic expressions in the numerators.

6. Professor K simplifies the _____ by using the Distributive Property.

7. Professor K can add the numerators of the two fractions because the denominators are _____.

8. 2 - 6 = _____

9. $(2 + 3)x + (2 - 6)$ = _____

Add and simplify the following fractions. Show your work and write the answers on the blanks.

10. $\frac{3(x+2)}{5} + \frac{2(x-2)}{5}$ = _____

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11. $\frac{4(x+1)}{3}+\frac{3(x-2)}{3}=$ _____

12. $\frac{2(x+2)}{9}+\frac{4(x-1)}{9}=$ _____

Refer to Example Set 2 to answer questions 13-17.

13. In Step 1, $2(x + 3) =$ ___ • $x +$ ____• 3.

14. In Step 2, Professor K changed the original complex fraction into a(n) _____ problem.

15. In Step 3, the ***reciprocal*** of x is _____.

16. The inverse of a number is its _____.

17. $\frac{(2x+6)\bullet 1}{4\bullet x}=$ _____

Simplify the following algebraic expressions containing complex fractions.

18. $\frac{\frac{3(x+2)}{5}}{x}=$ _____

(a) $\frac{3x+6}{5x}$ (b) $^{9}/_{5}$ (c) $\frac{x^2+6x}{5}$ (d) $\frac{3x+6}{5}x$

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19. $\dfrac{\dfrac{5(x+3)}{7}}{x}$ = _____

20. $\dfrac{\dfrac{7(x+2)}{3}}{x}$ = _____

Refer to Example Set 3 to answer questions 21-24.

21. In Step 1, Professor K changed the complex fraction into a _____ problem.

22. In Step 2, x = _____.

23. In Step 3, $\dfrac{x \bullet 3}{1 \bullet 4(2x-5)}$ = _____.

24. $4(2x - 5)$ = ___ • $2x$ - _____ • 5

Simplify the following complex fractions. Show your work and write your answers on the blanks.

25. $\dfrac{x}{\dfrac{5(2x-1)}{3}}$ = _____

(a) $\dfrac{3}{10x-5}x$ (c) $\dfrac{3x}{10x-5}$ (e) all of these

(b) $\dfrac{3x^2}{5(2x-1)}$ (d) $\dfrac{3}{5(2x-1)}$ (f) none of these

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26. $\dfrac{x}{\dfrac{3(3x-2)}{7}} =$ _____

27. $\dfrac{x}{\dfrac{2(4x-9)}{5}} =$ _____

28. Write the **Life Principle**: "_____
_____."

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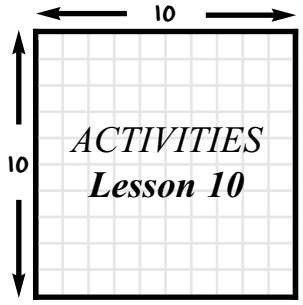
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Date: _____ Grade: _____



Algebra

Multiple Expressions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The native ate the elephant "_____ at a(n) _____."

2. A(n) _____ is a journey or trip, usually to Africa, for hunting or taking pictures.

3. In mathematics, how should you work toward the final answer? _____

Refer to Example Set 1 to answer questions 4-9.

4. In Step 1, $4(3x - 2) =$ ___ $\bullet\ 3x - 4 \bullet 2$.

5. In Step 2, $2(2x + 3) = 4x +$ _____.

6. In Step 4, $\frac{4x+6}{20x}$ became _____ after the fraction was inverted.

7. In Step 5, $(12x - 8) \bullet 20x =$ _____$x^2 - 160x$.

8. In Step 5, multiplication in the denominator was performed by the _____ method.

9. Complete the missing step in Step 5: $(6x + 30)(4x + 6) = 24x^2 +$ ____$x + 120x + 180$.

Refer to Example Set 2 to answer questions 10-15.

10. In Step 1, $2(3x + 1) =$ ___ $\bullet\ 3x + 2 \bullet 1$.

11. In Step 2, $2(x - 2) = 2x -$ _____.

12. In Step 4, $\frac{3x+6}{2x-4}$ became _____ after the fraction was inverted.

13. In Step 5, $(3x + 6)(3x + 6) =$ _____$x^2 + 36x + 36$.

14. In Step 5, multiplication in the denominator was performed by the _____ method.

15. Complete the missing step in Step 5: $(3x + 6)(3x + 6) = 9x^2 +$ ____$x + 18x + 36$.

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Simplify the following complex fractions containing algebraic expressions.

16. $\dfrac{\dfrac{2(x-1)}{3(x+1)}}{\dfrac{2(x+3)}{5(x+2)}} =$ _____

(a) $\dfrac{5(x^2+x-2)}{3(x^2+4x+3)}$ (c) $\dfrac{5x^2-2x+2}{3x^2+4x+3}$ (e) a or b (f) none of these

(b) $\dfrac{5x^2+5x-10}{3x^2+12x+9}$ (d) $\dfrac{5x^2-x-2}{3x^2-4x-3}$ (f) c or d

17. $\dfrac{\dfrac{3(2x-1)}{2(x+5)}}{\dfrac{3(x+3)}{2(4x-1)}} =$ _____

18. $\dfrac{\dfrac{5(x-2)}{6(x+2)}}{\dfrac{3(2x+1)}{2(4x+2)}} =$ _____

19. $\dfrac{\dfrac{10(3x+2)}{7(x+5)}}{\dfrac{2x+3}{2(3x-3)}} =$ _____

20. Write the **Life Principle**: "_____
_____."

Ask your teacher for the quiz over lessons 6-10 before proceeding to the next section.

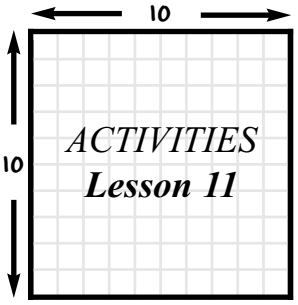


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Geometry

Perimeter



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The lengths of the sides of shapes are sometimes given in the form of _____.

2. Example Set 1 shows you how to determine the _____ of shapes whose lengths are shown as polynomials.

Refer to Example Set 1 to answer questions 3-14.

3. The mathematical expression for, "four more than twice the width," is _____ (Step 1).

4. The expression, $2x + 4$ represents the _____ of the rectangle.

5. The formula for the ***perimeter*** of a rectangle is _____.

6. In Step 3, $2(2x + 4) = 4x + 8$ is an example of the _____.

7. In Step 4, Professor K rearranged the ***rhs*** of the equation using the _____ _____ of Addition.

8. The abbreviation, *rhs* means _____.

9. In Step 4, Professor K then combined _____ terms.

10. In Step 4, $4x + 2x =$ _____.

11. In Step 5, Professor K subtracted _____ from both sides of the equation.

12. In Step 6, Professor K _____ both sides of the equation by six.

13. In Step 6, $^{12}/_{6} =$ _____ and $^{6x}/_{6} =$ _____.

14. In Step 7, Professor K _____ the value of x into the polynomials for the width and length.

Refer to Example Set 2 to answer questions 15-23.

15. The sides of the triangle are consecutive _____.

16. A member of the set of numbers {…-3, -2, -1, 0, 1, 2, 3, …} is called a(n) _____.

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17. Except for circles or spheres, the distance around a shape is called its _____.
(a) area (b) circumference (c) perimeter (d) latitude

18. In Step 3, $x + x + x =$ _____.

19. In Step 4, Professor K subtracts _____ from both sides of the equation.

20. In Step 5, Professor K divides both sides of the equation by _____.

21. In Step 5, $^{60}/_{3} =$ _____.

22. In Step 5, $^{3x}/_{3} =$ _____.

23. The dimensions of the triangle with sides that are three consecutive ***integers*** and a perimeter of 63 inches are: $s_1 =$ _____, $s_2 =$ _____, $s_3 =$ _____.

Work the following perimeter problems. Show your work and write your answers on the blanks.

24. The length of a rectangle is five times the width plus one inch. If the perimeter of the rectangle is 38 inches, calculate the dimensions of the rectangle.
$l =$ _____ $w =$ _____
Let x = width $P = 2l + 2w \rightarrow 38 = 2(5x + 1) + 2x$
$5x + 1$ = length

25. The length of a rectangle is two times the width plus three inches. If the perimeter of the rectangle is 36 inches, calculate the dimensions of the rectangle.
$l =$ _____ $w =$ _____
(a) $l = 12$, $w = 6$ (b) $l = 9$, $w = 9$ (c) $l = 13$, $w = 5$ (d) $l = 11$, $w = 4$

26. The length of a rectangle is the width plus seven centimeters. If the perimeter of the rectangle is 54 centimeters, calculate the dimensions of the rectangle.
$l =$ _____ $w =$ _____

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27. The sides of a triangle are consecutive, even integers. The perimeter of the triangle is 36 meters. Determine the length of the sides. s_1 = _____, s_2 = _____, s_3 = _____

Let $s_1 = x$ $x + x + 2 + x + 4 = 36$

$s_2 = x + 2$

$s_3 = x + 4$

28. The sides of a triangle are consecutive, even integers. The perimeter of the triangle is 96 feet. Determine the length of the sides. s_1 = _____, s_2 = _____, s_3 = _____

Let $s_1 = x$

$s_2 = x + 2$

$s_3 = x + 4$

(a) 20, 22, 24 (b) 30, 32, 34 (c) 15, 16, 17 (d) 10, 12, 14

29. The sides of a triangle are consecutive integers that are multiples of 5. The perimeter of the triangle is 105 inches. Determine the length of the sides. s_1 = _____, s_2 = _____, s_3 = _____

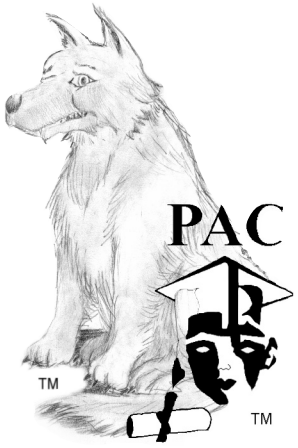
Let $s_1 = x$

$s_2 = x + 5$

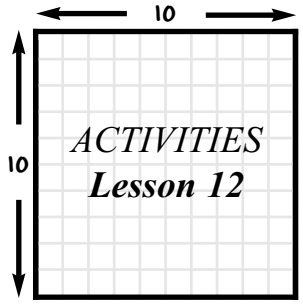
$s_3 = x + 10$

30. Write the **Life Principle**: "_____ _____."

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Geometry

Similarity

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. This lesson uses the properties of _____ in problems with shapes whose dimensions contain polynomials.

Refer to Example Set 1 to answer questions 2-10.

2. The length of a leg of the smaller triangle is _____.

3. The length of a leg of the larger triangle is _____.

4. The base of the smaller ***isosceles*** triangle is _____ cm.

5. In Step 2, Professor K set up a(n) _____ between the sides of the two triangles.

6. In Step 2, $\frac{x}{x+5} =$ _____

7. In Step 2, $\frac{x}{x+5} = \frac{1}{2} \rightarrow$ _____ $= 1 \bullet (x+5)$

8. In Step 3, Professor K _____ x from both sides of the equation.

9. The abbreviation, *lhs* means _____.

10. In Step 4, AB = x = _____ cm. AC = $x + 5$ = _____ cm.

Refer to Example Set 2 to answer questions 11-15.

11. In Step 1, Professor K set up a(n) _____ between the sides of rectangle A and rectangle B.

12. In Step 2, $\frac{2}{x+4} = \frac{8}{12} \rightarrow 12(2) =$ _____$(x+4)$.

13. In Step 3, Professor K subtracted _____ from both sides of the equation.

14. In Step 4, Professor K divided both sides by eight to determine that the value of x is _____.

15. In Step 5, after substituting the value of x calculated in Step 4 into the polynomial for the side of the rectangle A, Professor K determined that the dimensions of rectangle A was 2 inches by _____ inches.

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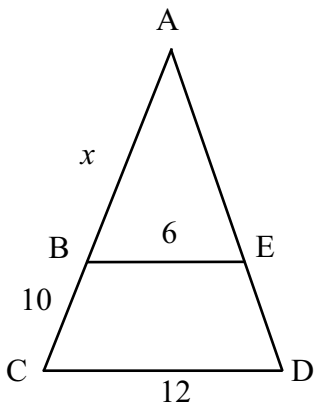
Work the following similarity problems containing polynomials. Shapes are not necessarily to scale. Show your work and write your answers on the blanks.

16. Look at the similar triangles below. Determine the dimensions of △ACD.

AC = ___; CD = ___; AD = ___

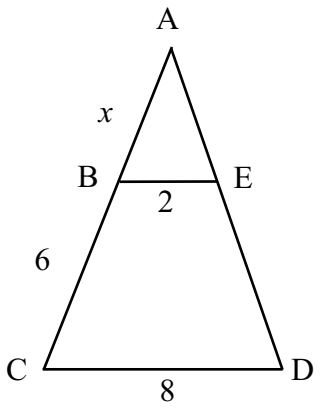
(a) AC = 20, CD = 12, AD = 20 (c) AC = 10, CD = 12, AD = 10

(b) AC = 16, CD = 12, AD = 16 (d) AC = 15, CD = 12, AD = 12



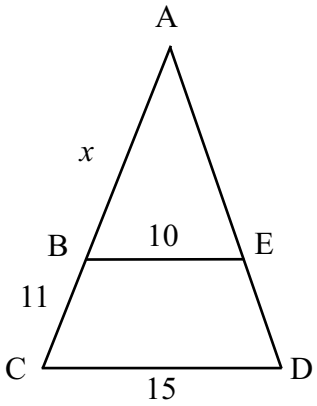
17. Look at the similar triangles below. Determine the dimensions of △ACD.

AC = ___; CD = ___; AD = ___



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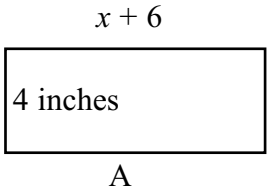
18. Look at the similar triangles below. Determine the dimensions of △ABE.
AB =___; BE = ___; AE = ___

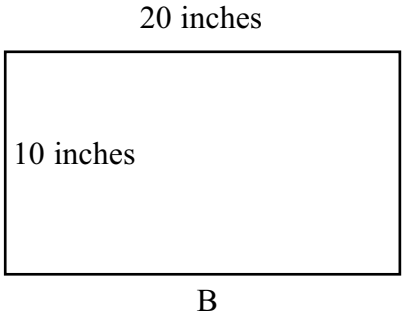


19. Determine the dimensions of rectangle A below by using the properties of similarity.

_____

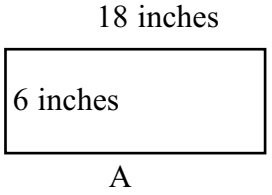
(a) 2 in. × 4 in. (c) 6 in. × 4 in. (e) 10 in. × 4 in.
(b) 4 in. × 4 in. (d) 8 in. × 4 in.

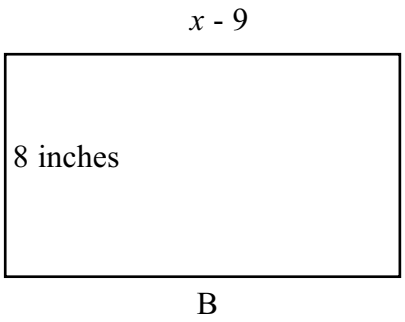




20. Determine the dimensions of rectangle B below by using the properties of similarity.

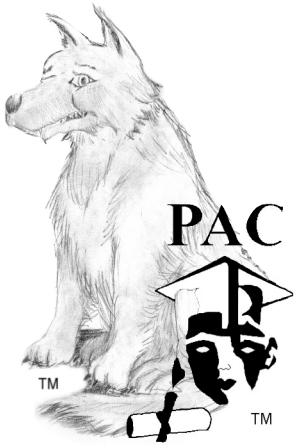
_____





21. Write the **Life Principle**: "_____
_____."

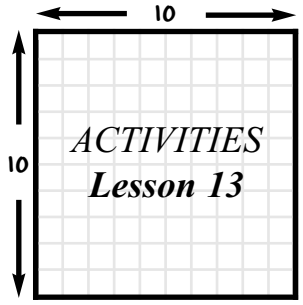
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Name: _____

Date: _____ Grade: _____



Geometry

Other Perimeters

You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Some perimeter problems contain _____ for the length of the sides of shapes.

Refer to Example Set 1 to answer questions 2-9.

2. The shapes described are _____.

3. In Step 1, Professor K transforms the description of the dimensions of the pentagons into _____ terms.

4. The pentagons are _____ pentagons.

5. Equilateral means that the sides are of _____ length.

6. The formula for the perimeter of the sides of an ***equilateral pentagon*** is _____.

7. In Step 3, $^{20}/_{5} = {}^{5x}/_{5} \rightarrow$ _____ $= x$.

8. In Step 4, $x + 5 \rightarrow 4 + 5 =$ _____ inches.

9. In Step 5, Professor K determined that the perimeter of the first pentagon is _____.

Refer to Example Set 2 to answer questions 10-18.

10. The circumference of the circle is _____.

11. The radius of the circle is given in the form of the polynomial _____.

12. The formula for the circumference of a circle is _____.

13. Professor K uses _____ as the value of π.

14. $\dfrac{2(22)(x-2)}{1 \bullet 7 \bullet 1} = \dfrac{44(x-2)}{_____}$

15. In Step 5, Professor K multiplies both sides of the equation by _____ to begin the isolation of the x.

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16. In Step 6, Professor K _____ both sides.
(a) adds 88 to (b) subtracts 88 from (c) multiplies 88 by (d) divides 88 by

17. In Step 6, Professor K _____ both sides by _____.

18. The radius of the circle is _____ inches.

Work the following perimeter problems that contain lengths given as polynomials. Show your work and write your answers on the blanks.

19. The length of the side of an equilateral pentagon is four inches more the length of the side of a second equilateral pentagon. If the perimeter of the second pentagon is 40 inches, calculate the perimeter of the first pentagon. _____

20. The lengths of the sides of a pentagon are consecutive integers. The perimeter of the pentagon is 60 meters. Calculate the lengths of the sides of the pentagon.

_____

$s_1 = x$ $x + x + 1 + x + 2 + x + 3 + x + 4 = 60$

$s_2 = x + 1$

$s_3 = x + 2$

$s_4 = x + 3$

$s_5 = x + 4$

21. The lengths of the sides of an octagon (eight sides) are 3 less than the lengths of the sides of a second octagon. The perimeter of the first octagon is 48 centimeters. Calculate the perimeter of the second octagon. _____
(a) 48 cm (b) 72 cm (c) 16 cm (d) 8 cm

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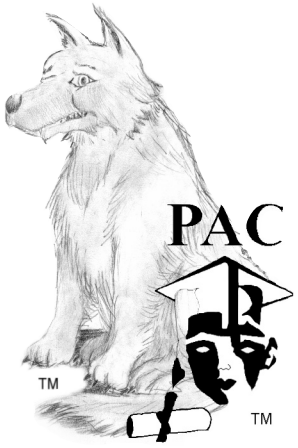
22. The circumference of a circle is 88 feet. The radius of the circle is given in the form of the polynomial $x + 2$. Calculate the diameter of the circle. _____
(a) 24 ft (b) 22 ft (c) 28 ft (d) 16 ft

23. The circumference of a circle is 132 inches. The radius of the circle is given in the form of the polynomial $x - 5$. Calculate the radius of the circle. _____

24. The circumference of a circle is 88 feet. The radius of the circle is given in the form of the polynomial $2x + 3$. Calculate the radius of the circle. _____

25. Write the **Life Principle**: "_____
_____."

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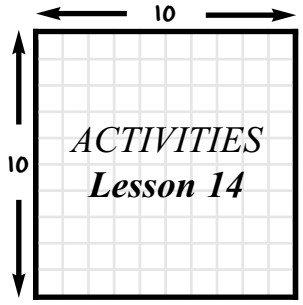


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Algebra

Factoring Polys



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. This lesson is about the _____ of polynomials.

2. Problems in life usually are not simple with only one _____ that causes the problem.

3. You must begin to break up a problem (in either life or mathematics) into all the separate _____.

4. Prime numbers are numbers that contain only _____ ***factors***: _____ and the number itself.

5. Composite numbers and prime numbers are the same. _____
(a) True or (b) False

6. Determining all the prime factors of a number or mathematical expression is called the _____ of that number or mathematical expression.

7. The complete factorization of 8 is: _____.

8. What Professor K likes to call the "un-distributing" procedure, mathematicians call _____.

9. To _____ means to determine all the prime factors of a mathematic term or expression.

Refer to Example Set 1 to answer questions 10-15.

10. In a), $30 = 3 \bullet 10 = ___ \bullet 5 \bullet 2$.

11. The factors of 30 are ____, _____, and _____.

12. In b), $x^3 = x \bullet x \bullet$ _____.

13. In b), $y^2 =$ ____$\bullet y$.

14. In b), $24 = 2 \bullet 2 \bullet$ _____ $\bullet 3$.

15. The ***complete factorization*** of $24x^3y^2$ is _____.

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Refer to Example Set 2 to answer questions 16-18.

16. Professor K factors out a 3 from the binomial by _____ both terms by three.

17. The 3 that is factored out is placed on the _____ of the parentheses.

18. $3(x + 3) = 3 \bullet x + 3 \bullet 3 = 3x +$ _____

19. To check a factoring problem, you use the _____ to undo the factorization.

Refer to Example Set 3 to answer questions 20-25.

20. In this example, Professor K factors a(n) _____.

21. The common factor in all of the terms is _____.

22. Professor K _____ each term by $2x$ to factor it out.

23. Professor K then placed the $2x$ _____ the parentheses.

24. To check his answer, Professor K used the _____.

25. After using the Distributive Property to check his answer, Professor K determined that the _____, $10ax + 24xb + 16xc$ is the same as the original trinomial.

(a) sum (b) difference (c) product (d) quotient

Refer to the examples as necessary to factor completely the following expressions. Show your work and check you answers by using the Distributive Property. Write your answers on the blanks.

26. $30x$ _____

27. $24x^2y^2$ _____

28. $6x + 12$ _____

29. $4x + 8$ _____

30. $8x + 16$ _____

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31. $7x - 21$ _____

32. $9a - 36$ _____

33. $4a + 12b + 16c$ _____
(a) $a + 3b + 4c$ (b) $2a + 6b + 8c$ (c) $2(2a + 6b + 8c)$ (d) $4(a + 3b + 4c)$

34. $5xy^2 - 10xy + 15$ _____

35. $4xa + 8xb + 12xc$ _____

36. $2x^3 - 4x^2 - 8x$ _____

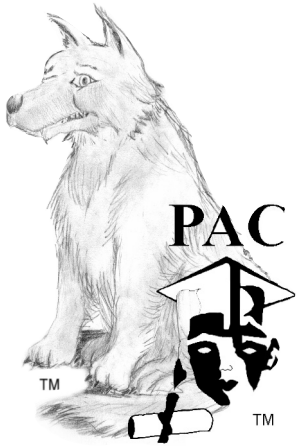
37. $3ax^2 + 3ax + 6a$ _____

38. $10x^2y + 20xy + 30y$ _____

39. $2xa + 2xb + 2xc + 2xd$ _____
(a) $2x(a + b + c + d)$ (b) $2x(abcd)$ (c) $2(xa + xb + xc + xd)$ (d) $a + b + c + d$

40. Write the **Life Principle**: "_____
_____."

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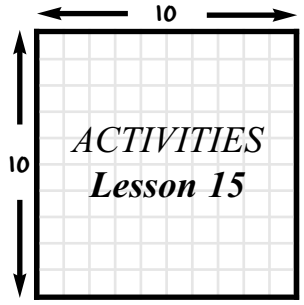
Name: _____

Date: _____ Grade: _____



Algebra

Reducing Fractions



You are making progress! ***Answer the following questions. Choose the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. You can reduce your frustrations in life if you _____ out the things that cause you problems.

2. Sometimes the answers are the _____ and the problems are the answers.

Refer to Example Set 1 to answer questions 3-6.

3. Professor K simplifies the fractional expression by factoring the numerator and denominator _____.

4. In Step 1, Professor K factors the numerator by determining the common ***factor*** to be _____.

5. In Step 2, $16x + 16 = (16 \bullet x) + (16 \bullet 1) =$ _____ $(x + 1)$.

6. $\frac{8x+16}{16x+16} = \frac{8(x+2)}{16(x+1)} = \frac{1(x+2)}{2(x+1)} = \frac{\quad\quad}{2x+2}$

7. You cannot divide out a factor unless the factor is contained in _____ of the terms of the expression.

8. Is there a common factor (other than one) in the fractional expression, $\frac{x+2}{2x+2}$? _____

(a) Yes or (b) No

9. Is there a common factor (other than one) in the fractional expression, $\frac{2x+2}{8x+8}$? _____

(a) Yes or (b) No

Refer to Example Set 2 to answer questions 10-13.

10. The common factor in the expression, $240x^2 - 160x$ is _____ (Step 1).

11. The common factor in the expression, $24x^2 + 156x + 180$ is _____.

12. $\frac{240x^2-160x}{24x^2+156x+180} = \frac{80x(3x-2)}{12(2x^2+13x+15)} = \frac{20x(_____)}{3(2x^2+13x+15)}$

13. In #13, $^{80}/_{12}$ is reduced to _____.

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Refer to Example Set 3 to answer questions 14-18.

14. The common factor of the numerator is _____.

15. The common factor of the denominator is _____.

16. $\frac{4}{4}=1$ and $\frac{(x-4)}{(x-4)}=$ _____

17. $\frac{4(x-4)}{16(x-4)}=\frac{4\bullet 1(x-4)}{4\bullet 4(x-4)}=1\bullet\frac{1}{4}\bullet 1=$ _____

18. A polynomial, such as (x - 4) is considered _____ term.

19. When the same term or number is in the numerator and denominator, $^{(x-4)}/_{(x-4),}$ the terms can _____ out.

Simplify completely the following mathematical expressions. Show your work and write your answers on the blanks.

20. $\frac{6x+18}{18x+36}=$ _____

(a) $\frac{x+2}{x+3}$ (b) $\frac{3(x+2)}{x+3}$ (c) $\frac{x+3}{3(x+2)}$ (d) 6

21. $\frac{2x+10}{6x+4}=$ _____

22. $\frac{3x+15}{6x^2+12x-6}=$ _____

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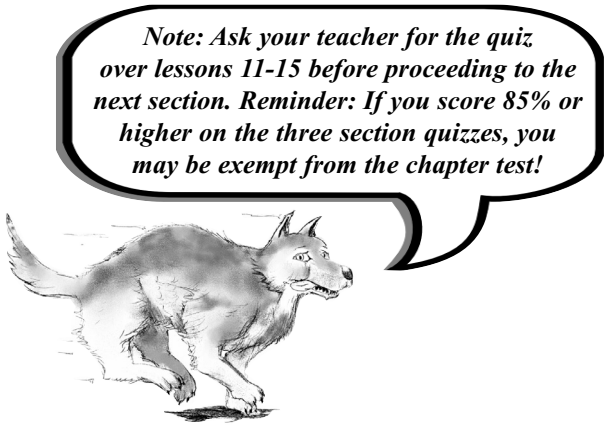
23. $\frac{7x-49}{14x^2+14x-28} =$ _____

24. $\frac{5x+15}{10x+30} =$ _____

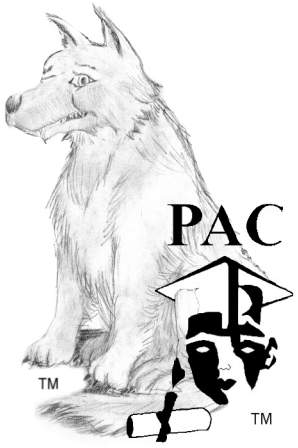
(a) $\frac{5(x+3)}{10(x+3)}$ (b) $^1/_2$ (c) 1 (d) $\frac{x+3}{2(x+3)}$

25. $\frac{9x-81}{3x-27} =$ _____

26. Write the **Life Principle**: "_____
_____."



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Intermediate Math Skills

Mathematics Charts

LENGTH - ENGLISH SYSTEM

12 inches	=	1 foot
3 feet	=	1 yard
5.5 yards	=	1 rod
320 rods	=	1 mile
1,760 yards	=	1 mile
5,280 feet	=	1 mile

VOLUME - ENGLISH SYSTEM

1 tablespoon, Tbsp, T	=	3 teaspoons, tsp
1 cup, c	=	16 tablespoons, Tbsp, T
1 pint, pt	=	2 cups, c
1 quart, qt	=	2 pints, pts
1 gallon, gal	=	4 quarts, qts

WEIGHT - ENGLISH SYSTEM

1 pound, lb	=	16 ounces, oz
1 hundredweight, cwt	=	100 pounds, lbs
1 ton	=	20 hundredweight, cwt
1 ton	=	2000 pounds, lbs

LENGTH - METRIC SYSTEM

1 meter	=	1,000 millimeters
1 meter	=	100 centimeters
1 kilometer	=	1,000 meters
1 centimeter	=	10 millimeters

VOLUME - METRIC SYSTEM

1 liter	=	1,000 milliliters
1 liter	=	100 centiliters
1 kiloliter	=	1,000 liters
1 centiliter	=	10 milliliters

WEIGHT - METRIC SYSTEM

1 gram	=	1,000 milligrams
1 gram	=	100 centigrams
1 kilogram	=	1,000 grams
1 centigram	=	10 milligrams

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Mathematics Charts

PERFECT SQUARES

$\sqrt{1}=1$	$\sqrt{25}=5$	$\sqrt{81}=9$	$\sqrt{169}=13$
$\sqrt{4}=2$	$\sqrt{36}=6$	$\sqrt{100}=10$	$\sqrt{196}=14$
$\sqrt{9}=3$	$\sqrt{49}=7$	$\sqrt{121}=11$	$\sqrt{225}=15$
$\sqrt{16}=4$	$\sqrt{64}=8$	$\sqrt{144}=12$	$\sqrt{256}=16$

PERFECT CUBES

$\sqrt[3]{1}=1$	$\sqrt[3]{-8}=-2$	$\sqrt[3]{64}=4$	$\sqrt[3]{-125}=-5$
$\sqrt[3]{-1}=-1$	$\sqrt[3]{27}=3$	$\sqrt[3]{-64}=-4$	$\sqrt[3]{216}=6$
$\sqrt[3]{8}=2$	$\sqrt[3]{-27}=-3$	$\sqrt[3]{125}=5$	$\sqrt[3]{-216}=-6$

$$P = \frac{\text{the number of elements in the set containing favorable outcomes}}{\text{the number of elements in the sample set}}$$

$$Midpoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

FORMULAS

Surface Area	Area	Volume	Perimeter/ Circumference	Others
Sphere: $A_s = 4\pi r^2$	**Triangle:** $A = {}^1\!/_2 bh$	**Sphere:** $V = {}^4\!/_3 \pi r^3$	**Perimeter of a Rectangle:** $P = 2w + 2l$	**Pythagorean Theorem:** $c^2 = a^2 + b^2$
Cylinder: $A_s = 2\pi rh + 2\pi r^2$	**Rectangle:** $A = l \times w$	**Cone:** $V = {}^1\!/_3 \pi r^2 h$	**Circumference of a Circle:** $C = 2\pi r$ or $C = \pi d$	**Convert to Fahrenheit:** $F = {}^9\!/_5 C + 32$
Cube: $A_s = 6s^2$	**Circle:** $A = \pi r^2$	**Rectangular Prism:** $V = l \times w \times h$		**Convert to Celsius:** $C = {}^5\!/_9 (F - 32)$
Lateral Surface Area of a Cone: $A_{ls} = \pi rl$	**Trapezoid:** $A = {}^1\!/_2 (b_1 + b_2)h$	**Square Pyramid:** $V = ({}^1\!/_3) lwh$		**Distance:** $d = r \bullet t$
		Triangular Prism: $V = {}^1\!/_2 bhl$		**Slope:** $y = mx = b$
		Cylinder: $V = \pi r^2 h$		**Simple Interest:** $I = prt$

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Mathematics Charts

TIME CONVERSIONS

1 week = 7 days
1 year = 12 months

CONVERSIONS

English to Metric	
1 ounce (oz)	28.35 grams (g)
1 pound (lb)	454 grams (g)
1 ton (T)	907.2 kilograms (kg)

Metric to English	
1 gram (g)	.035 ounce (oz)
1 kilogram (kg)	2.2 pounds (lb)
1 metric ton (mt)	2200 pounds (lb)

English to Metric	
1 cubic inch	16.39 cubic cm
1 gallon	3.785 liters
1 cubic foot	28.316 liters
1 quart	.946 liters

Metric to English	
1 cubic cm	.061 cubic inch
1 cubic meter	35.315 cubic feet
1 liter	1.05 quarts
1 liter	.264 gallon

English to Metric	
1 inch	2.54 cm
1 foot	0.3048 meter
1 yard	0.9144 meter
1 mile	1.6 km

Metric to English	
1 centimeter	0.3937 in.
1 meter	39.37 in.
1 meter	1.09 yds
1 kilometer	0.6213 mile

AREA CONVERSIONS

1 square centimeter = 0.155000 sq in.
1 square meter = 10.763910 sq ft
1 square inch = 645.16 sq mm
1 square foot = 0.09290304 sq meter
1 square yard = 0.836127 sq meter
1 square foot = 144 sq in.

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