

Friendship Junior High School  
Sixth & Seventh Grade Advanced Math  
(TDP Pull-Out Program)

*Skill Mastery  
Packet*

*(Remediation Problems)*



TDP Math Units 1-18

Working With Integers  
Order of Operations  
Evaluating Expressions  
Solving Equations  
Problem Solving  
Polygons  
Angle Relationships  
Circles & Sectors

Foundation Skills  
Simplifying Expressions  
Radical Operations  
Equations & Inequalities  
Working With Monomials  
Working With Polynomials  
Linear Equations  
Linear Systems  
Factoring  
Quadratic Equations



UNIT 1: SKILL MASTERY

# Working With Integers

Place a comparison sign between the integers:

- ① A)  $-7 \square -12$   
 B)  $-5 \square -3$   
 C)  $-8 \square 0$

Perform the indicated operations:

- ② A)  $(-12) + (-6)$   
 B)  $(-18) + (+9)$   
 C)  $(+8) + (-5)$
- ③ A)  $(-6) \times (+5)$   
 B)  $(+4) \times (-7)$   
 C)  $(-9) \times (-4)$

- ④ A)  $(-12) - (+7)$   
 B)  $(+9) - (-8)$   
 C)  $(-10) - (-12)$

- ⑤ A)  $(-18) \div (+3)$

B)  $(-12) \div (-2)$

C)  $(+16) \div (-4)$



Perform the operations.  
 Show your work:

- ⑥ A)  $(-3) + (+5) - (+7) - (-6) + (+8)$   
 B)  $(-2) - (+7) - (-8) + (-3) - (-5)$   
 C)  $(+7) - (+9) + (-4) - (-6) - (+8)$



## UNIT 2: SKILL MASTERY

# Order Of Operations

Determine the value of each expression:

① A)  $(-2)^3$

B)  $(-3)^2$

C)  $-2^2$

② A)  $5^2$

B)  $3^3$

C)  $7^0$

③ A)  $-6 + 8 \cdot (-3)$

B)  $(-2) - (+6) \cdot (-2)$

C)  $-3 - (+4)(-2) - 3$

④ A)  $(-6) - (-2)(+3)$

B)  $(+7) - (-3) + (-2)(+5)$

C)  $(2-5)(-3) - (-4)$

⑤ A)  $(-6)(-2)^2$

B)  $(+3)^0(-1)^2$

C)  $(-3)(-2)^3$

⑥ A)  $(-2)^2 - (3-5) - 3^2$

B)  $(+3) - (-2)^3 + (2-3)$

C)  $(-4) + (3-7) - (-3)^2$



UNIT 3: SKILL MASTERY

# Evaluating Expressions

Evaluate each expression:

$$a = -1 \quad b = -2 \quad c = 2$$

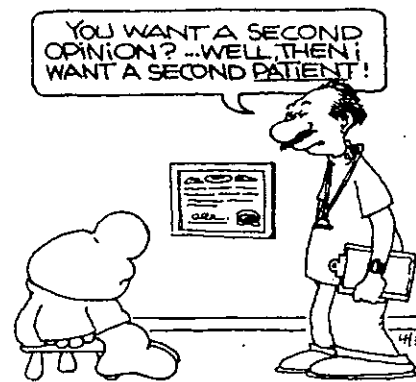
- ① A)  $a + b$   
 B)  $b - c$   
 C)  $c + b + a$

- ② A)  $2a + 3b$   
 B)  $4b - a$   
 C)  $2c + 3a$

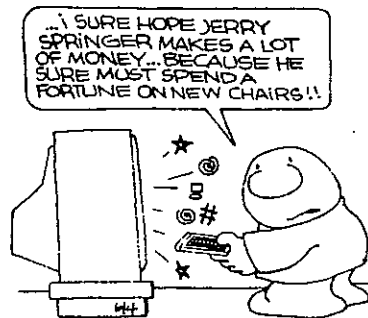
- ③ A)  $c + 4a$   
 B)  $2b + 2c$   
 C)  $3a - c$

- ④ A)  $2ab - c^2$   
 B)  $3a^2 - 2bc$   
 C)  $ac - b^2$

- ⑤ A)  $ab^2c$   
 B)  $a^2bc^2$   
 C)  $a^3bc$



- ⑥ A)  $2a(a-b)^2$   
 B)  $c^2(2a+b)$   
 C)  $3a^3(b-c)$



UNIT 4: SKILL MASTERY

# Solving Equations

Solve each equation and show all steps:

① A)  $n + 6 = -5$

B)  $3 + n = 12$

C)  $n + 7 = -6$

② A)  $2n - 4 = 6$

B)  $3n - 5 = -11$

C)  $2n - 3 = 9$

③ A)  $2n - 7 = -4$

B)  $3n + 6 = 5$

C)  $5n + 8 = -1$

④ A)  $n + 5 + 2n = n + 4 + 3n + 2$

B)  $2n - 6 - 5n = 8 + 2n + 1$

C)  $3 - n + 4 - 3n = 2n - 5 - 3n$

⑤ A)  $3(n - 4) = -6$

B)  $2(2n + 3) = -2$

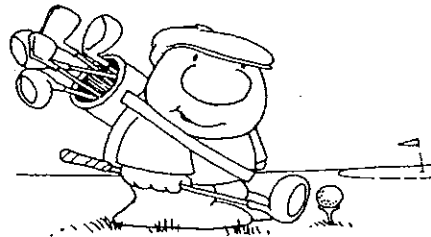
C)  $2(4n - 3) = 10$

⑥ A)  $2(n - 3) - 3(n + 4) = 1$

B)  $3(2n + 1) - 2(n - 3) = 5$

C)  $2(n - 5) - 3(2n + 1) = -1$

...I PLAY GOLF RELIGIOUSLY!  
IF I MAKE A SHOT  
...IT'S A MIRACLE!



## UNIT 5: SKILL MASTERY

# Problem Solving

Set up an equation and solve. Show your steps. Check your solution.

① A) A number increased by six is five. Find it.

B) A number increased by two is nine. Find it.

C) A number increased by six is negative two. Find it.

② A) Twice a number decreased by three is seven. Find the number.

B) Three times a number decreased by nine is twelve. Find the number.

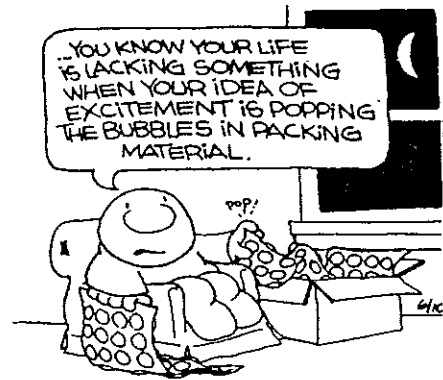
C) Twice a number decreased by eight is six. Find the number.

③ A) Fourteen decreased by twice a number is negative four. Find the number.

B) Eleven decreased by three times a number is negative seven. Find

the number.

C) Eight decreased by four times a number is negative twelve. Find the number.



④ A) Twice a number increased by three more than the number is fifteen. Find the number.

B) Three times a number increased by two less than the number is thirty-four. Find the number.

C) Four times a number increased by five less than the number is ten. Find the number.

## UNIT 5: SKILL MASTERY

# Problem Solving

⑤ A) Two more than three times a number decreased by one less than twice the number is one. Find the number.

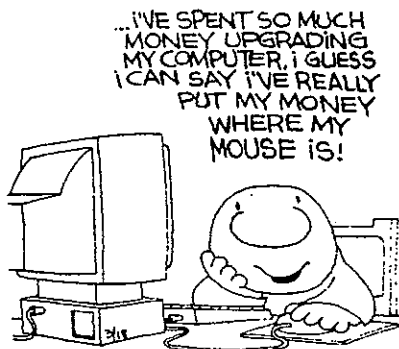
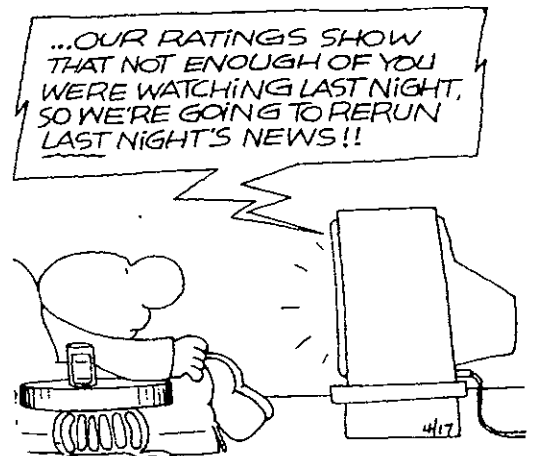
B) Three less than twice a number decreased by six more than the number is negative thirteen. Find the number.

C) Two less than a number decreased by four less than three times the number is twelve. Find the number.

⑥ A) Twice a number decreased by three more than the number is one more than three times the number. Find it.

B) Three times a number decreased by five more than twice the number is one less than twice the number. Find it.

C) Four times a number decreased by one less than twice the number is equal to the number. Find it.

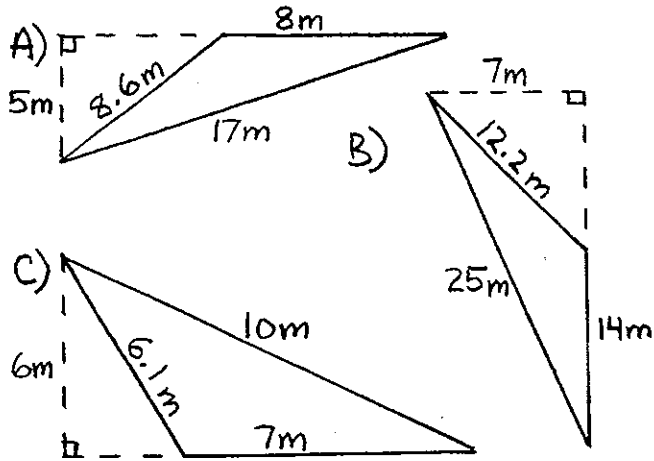




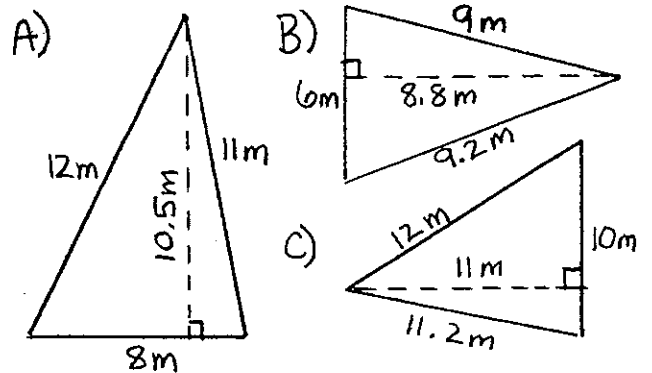
UNIT 6: SKILL MASTERY

# Polygons

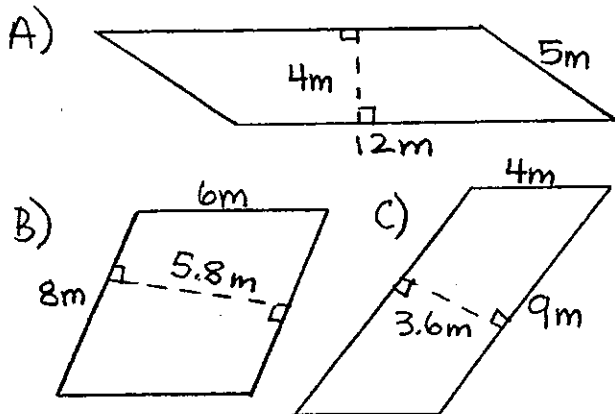
① Determine the area of the triangle:



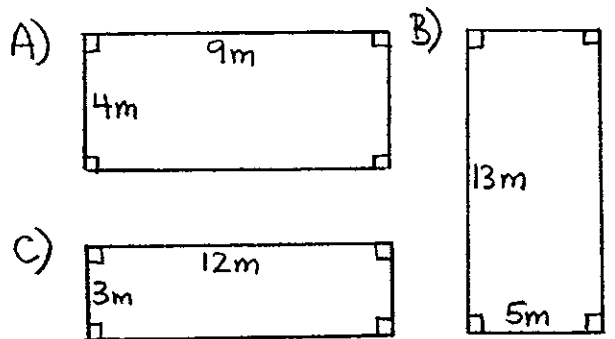
④ Determine the area of the triangle:



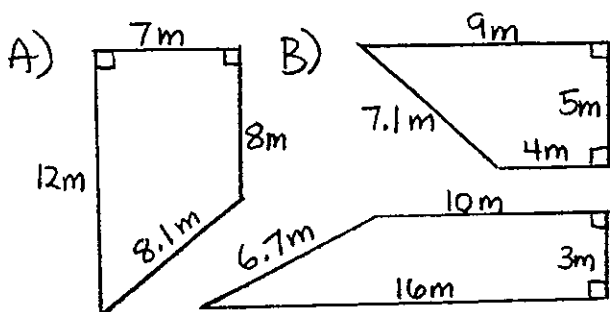
② Determine the perimeter of this parallelogram:



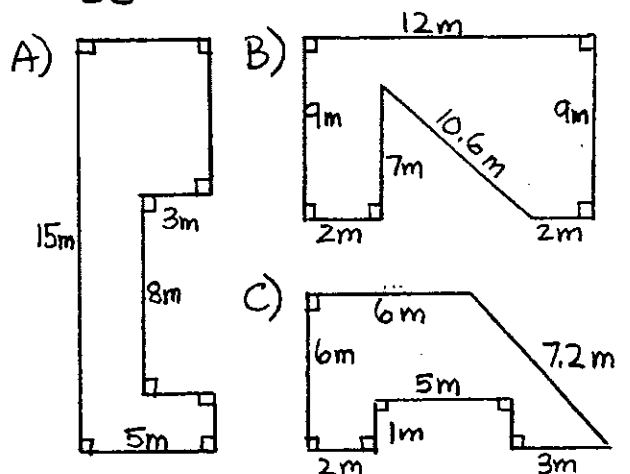
⑤ Determine the area of the rectangle:



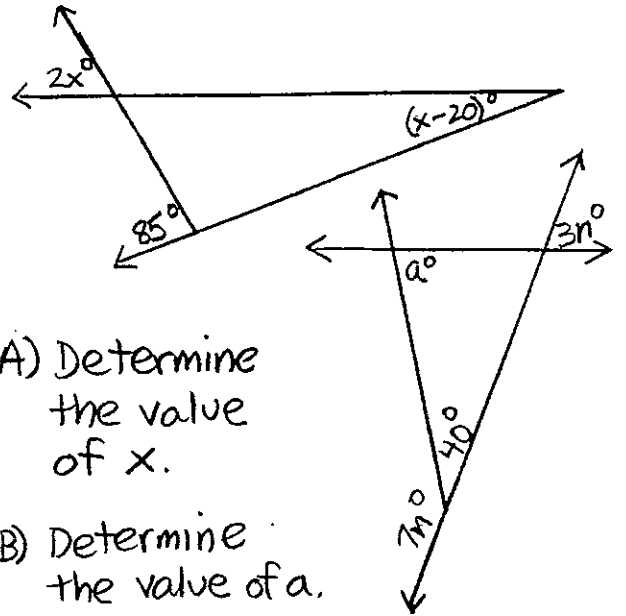
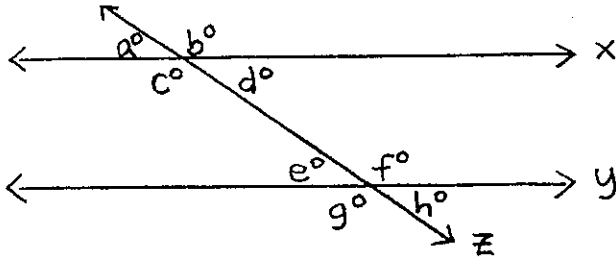
③ Determine the area of the trapezoid:



⑥ Determine the area of the polygon:



# Angle Relationships



① Name the angle that:

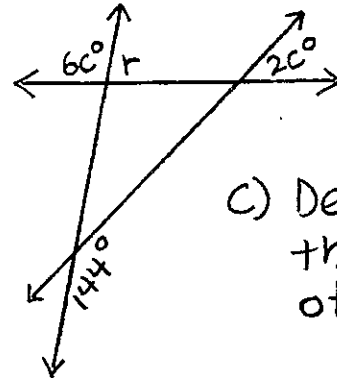
- A) corresponds to  $\angle e$
- B) is vertical to  $\angle b$
- C) corresponds to  $\angle h$

④ A) Determine the value of  $x$ .

B) Determine the value of  $a$ .

② Identify as (T/F):

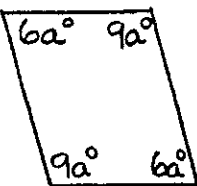
- A)  $\angle e$  &  $\angle c$  are adjacent
- B)  $\angle g$  &  $\angle f$  form a linear pair
- C)  $\angle g = \angle a$

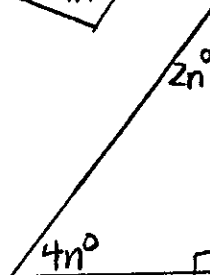
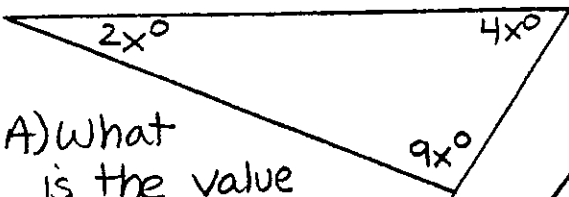


C) Determine the value of  $r$ .

③ A) What is the value of  $x$ ?

B) What is the value of  $n$ ?

C)  What is the value of  $a$ ?



⑤ A) How many degrees in the sum of the angles of a 12-sided polygon?

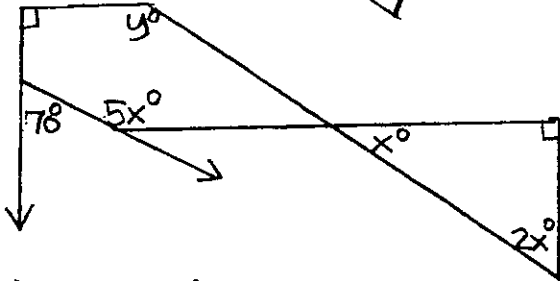
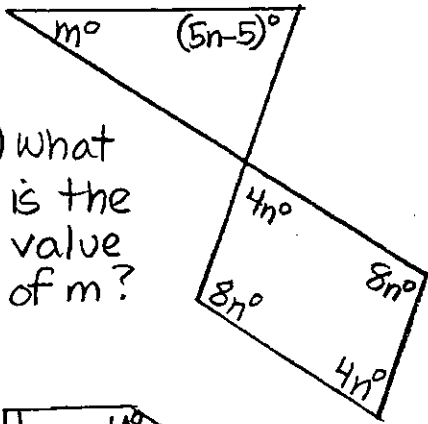
# Angle Relationships

B) How many degrees in the sum of the angles of a ten sided polygon?

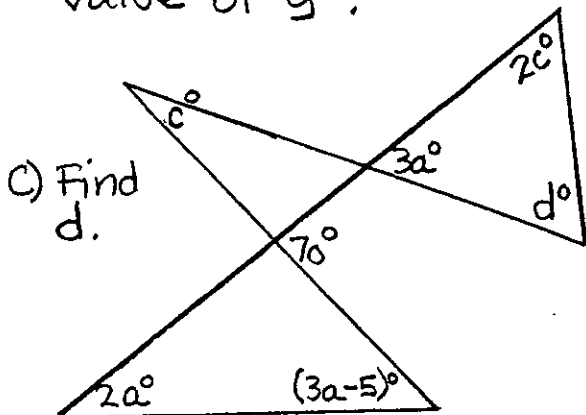
C) How many degrees in each angle of a regular pentagon?



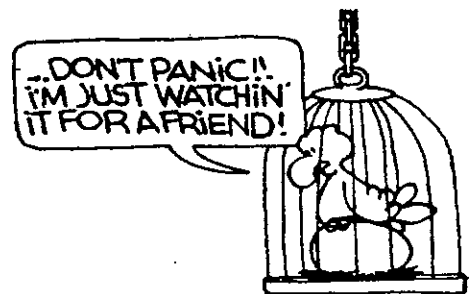
⑥ A) What is the value of  $m$ ?



B) What is the value of  $y$ ?



C) Find  $d$ .

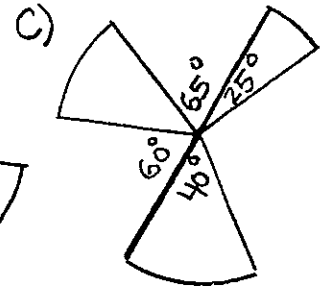
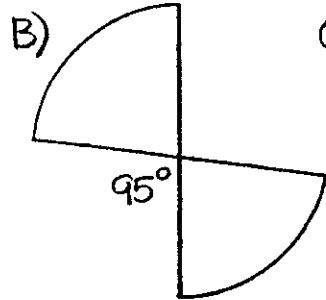
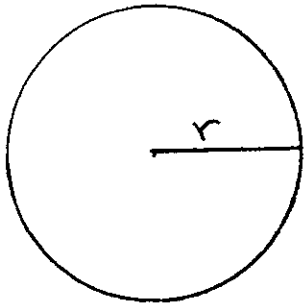


UNIT 8: SKILL MASTERY

# Circles & Sectors

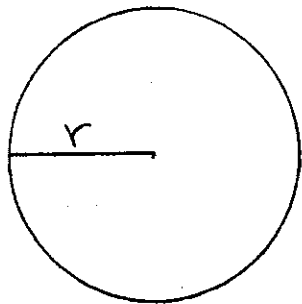
① Determine the area of the circle:

- A)  $r = 5\text{m}$
- B)  $r = 4.5\text{m}$
- C)  $r = 9\text{m}$

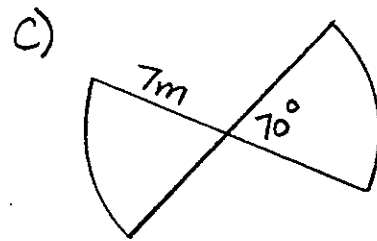
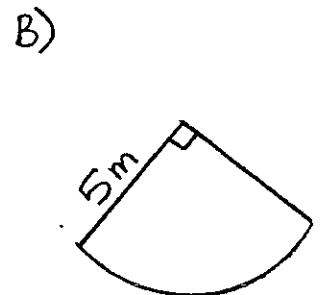
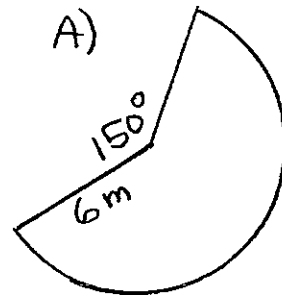


⑤ Determine the area of the sector:

② Determine the circumference of the circle:

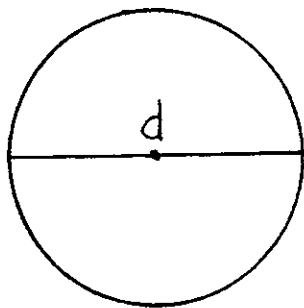


- A)  $r = 6\text{m}$
- B)  $r = 3.5\text{m}$
- C)  $r = 7\text{m}$

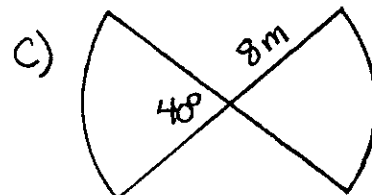
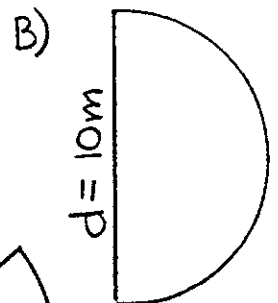
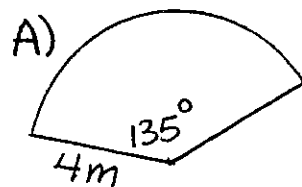


③ Determine the area:

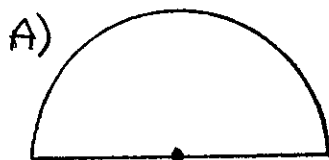
- A)  $d = 11\text{m}$
- B)  $d = 16\text{m}$
- C)  $d = 13\text{m}$



⑥ Determine the circumference:



④ Determine the central angle:



UNIT 9: SKILL MASTERY

# Foundation Skills

Integers:

- ① A)  $(-8) + (-4)$   
 B)  $(-9) - (-7)$   
 C)  $(-12) \div (+3)$

Exponents:

- ② A)  $(-2)^3$   
 B)  $(-1)^4$   
 C)  $-2^2$

Order of operations:

- ③ A)  $(-3) + (-2)(+3) - (-4)$   
 B)  $(-2) - (+3)(-4) - (+5)$   
 C)  $(-3)(-4) - (-6) - (-1)(-2)$
- ④ A)  $(-1)^4 + (-5) - (-2)^3$   
 B)  $(-3)^3 - (-4)^0 + (-3)^2$   
 C)  $(-1)^5 - (-1)^4 - (-1)^3$

Evaluating expressions:  
 $a = -1$   $b = -2$   $c = 2$

- ⑤ A)  $2ab - b^2$   
 B)  $a^2c - b^2a$   
 C)  $3a^3 + 2a^2b$



- ⑥ A)  $\frac{(a+b) - c}{3a + b}$   
 B)  $\frac{c^2 - (a+b)^2}{ab^3}$   
 C)  $\frac{a^2c - 2(b-c)}{abc}$

UNIT 10: SKILL MASTERY

# Simplifying Expressions

Combining terms:

① A)  $3xy + x - 2y - xy - 4x$

B)  $2a - 3b + 4 - 5b - 6 - 8a$

C)  $2m - 3mn - 4m - 5n + 4mn$

② A)  $4x^2 - 3x + 2x^2 - 5 - 8x$

B)  $ab - 2a^2 + 3a^2b - 4ab - 2a^2$

C)  $xy + x + y - 2xy - x - y$

Distributive Property:

③ A)  $3(2x - y)$

B)  $-2(a - 3y)$

C)  $5(2m + 3n)$

④ A)  $2(3x - y) - 3(x - 2y)$

B)  $3(a + b) - 2(2a - b)$

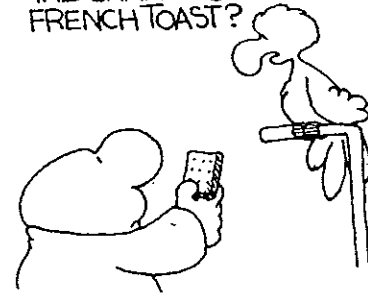
C)  $-2(x - 3y) + 2(3x - y)$

⑤ A)  $2xy - 3y^2 - y(x + 2y)$

B)  $ab - 3a - 2a(b - 4)$

C)  $3x^2 - 2x(x + y) + xy$

...I'M GETTING TIRED OF CRACKERS...WHAT ARE THE CHANCES FOR SOME FRENCH TOAST?



⑥ A)  $a^2 - 2a^2b - 3a(ab - 2a)$

B)  $2x^2y - 3x(y - 2xy)$

C)  $ab^2 - 2a^2b + 3a(b^2 - ab)$



UNIT 11: SKILL MASTERY

# Radical Operations

Make a number line with tick marks for all integers from -5 to +5. Use an arrow to indicate the value of each radical:

- ① A)  $\sqrt{12}$   
 B)  $-\sqrt{21}$   
 C)  $\sqrt{5}$

Simplify each radical:

- ② A)  $\sqrt{216}$   
 B)  $\sqrt{175}$   
 C)  $\sqrt{189}$
- ③ A)  $2\sqrt{200}$   
 B)  $3\sqrt{180}$   
 C)  $5\sqrt{125}$

Add/Subtract:

- ④ A)  $\sqrt{2} - 2\sqrt{3} + 3\sqrt{2} - 2\sqrt{2} - 4\sqrt{3}$   
 B)  $\sqrt{5} + 3\sqrt{7} - \sqrt{7} + 2\sqrt{5} + 2\sqrt{7}$

C)  $\sqrt{6} - 3\sqrt{6} + 4\sqrt{6} - 5\sqrt{6} + \sqrt{3}$

multiply and simplify:

- ⑤ A)  $(\sqrt{2})(2\sqrt{6})(\sqrt{10})$   
 B)  $(3\sqrt{3})(3\sqrt{2})(\sqrt{12})$   
 C)  $(5\sqrt{5})(\sqrt{10})(2\sqrt{2})$



Combine and simplify:

- ⑥ A)  $2\sqrt{2} - \sqrt{72} + 3\sqrt{18}$   
 B)  $\sqrt{12} - 2\sqrt{27} + \sqrt{5} - \sqrt{20}$   
 C)  $2\sqrt{18} - \sqrt{75} + 2\sqrt{48}$

# Equations & Inequalities

Solve the equation:

- ① A)  $3(2x-4) = 6$   
 B)  $2(n-5) = -14$   
 C)  $4(x-3) = -20$

Set up an equation to solve this problem:

- ② A) Three less than twice a number is negative eleven. Find the number.  
 B) Four more than five times a number is negative eleven. Find the number.  
 C) Six less than three times a number is six. Find the number.

Solve the inequality:

- ③ A)  $2n > 3(n-4)$   
 B)  $3x-1 \leq 5(x-3)$   
 C)  $4a < 2(a-5)$

Solve the equation and graph the solution on

a number line:

- ④ A)  $3(2x-3) = 4x+5$   
 B)  $6(n-3) = 2(3n+2)$   
 C)  $4(2x-3) = 2(3x-6)+2x$

Solve the inequality and graph on a number line:

- ⑤ A)  $3x-5 < x+7$   
 B)  $2n-6 \geq 5n-9$   
 C)  $3(2n-1) < 8n-13$

Set up an equation & solve:

- ⑥ A) Two more than twice a number decreased by three less than the number is three more than twice the number.  
 B) Four times a number decreased by three less than five times the number is seven less than the number.  
 C) Two less than twice a number decreased by four more than four times the number is six more than twice the number.



# Working With Monomials

Multiply / Divide  
and simplify:

① A)  $(n^3)(n^7)$

B)  $(x^2)(x^3)(x^4)$

C)  $(a^5)(a^5)$

② A)  $(2ab)^3(a^2b^2)$

B)  $(x^2y)^3(3xy)^2$

C)  $(5ab^3)^2(a^2b)$

③ A)  $(-2x^2y)^3$

B)  $(-3ab^2)^2$

C)  $(-x^3y^2)^4$

④ A)  $\frac{a^4bc^2}{ab^3c}$

B)  $\frac{x^3y^2z}{x^5yz}$

C)  $\frac{a^4b^3c^2d}{ab^4c^2d^3}$

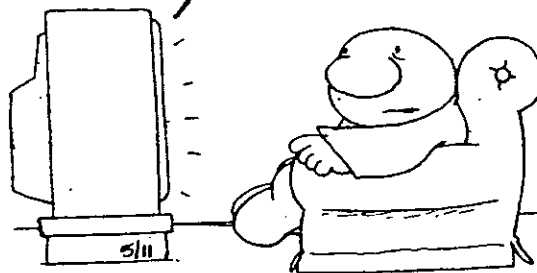
⑤ A)  $\frac{12a^{-3}b^2c^{-1}}{8ab^{-3}c^{-2}}$

B)  $\frac{15x^2y^{-3}z^{-1}}{9xy^{-5}z^2}$

C)  $\frac{-6a^{-2}b^{-3}c}{4a^{-3}b^2c^3}$

IF IT'S SUNDAY...IT'S  
MEET THE PRESS!

...AND IF IT'S MONDAY,  
...IT'S MEET THE STRESS!!



⑥ A)  $ab(-a^{-1}b^{-2})^2$

B)  $-2x(y^2z^{-1})^3$

C)  $xy^2(-x^2y^{-2})^3$

UNIT 14: SKILL MASTERY

# Working With Polynomials

Use FOIL to multiply:

- ① A)  $(x-3)(x-5)$   
 B)  $(n+2)(n-4)$   
 C)  $(x+4)(x+3)$

- ② A)  $(2x-y)(3x+2y)$   
 B)  $(3a+b)(2a+5b)$   
 C)  $(2x+3y)(x-4y)$

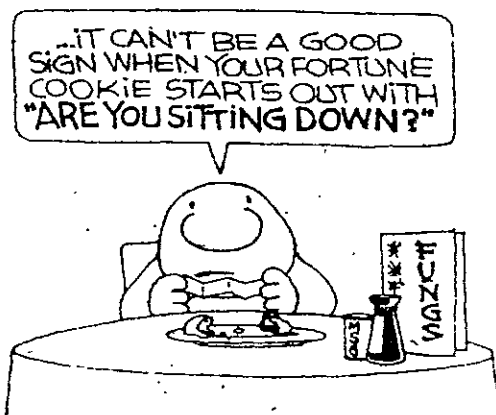
Use special product patterns to multiply:

- ③ A)  $(2n-3)(2n+3)$   
 B)  $(4x+y)(4x-y)$   
 C)  $(a-5b)(a+5b)$

- ④ A)  $(n-5)^2$   
 B)  $(n+3)^2$   
 C)  $(2n+1)^2$

Use polynomial division:

- ⑤ A)  $(2x^2+8x+6) \div (x+3)$   
 B)  $(3n^2-10n+8) \div (n-2)$   
 C)  $(6x^2+17x+10) \div (x+2)$



- ⑥ A)  $(3n^3+8n^2+n-8) \div (n+2)$   
 B)  $(4x^3-11x^2-8x+12) \div (x-3)$   
 C)  $(5x^3+8x^2+5x+6) \div (x+1)$

## UNIT 15: SKILL MASTERY

# Linear Equations

① Graph a line through the point with a given slope:

A)  $(-2, 5)$  slope  $\frac{2}{3}$

B)  $(3, -1)$  slope  $-4$

C)  $(4, 2)$  slope  $-\frac{1}{3}$

② Determine the slope and both intercepts for this equation in slope-intercept form:

A)  $y = -2x + 6$

B)  $y = 3x - 9$

C)  $y = -5x - 15$

③ Graph this equation using the intercepts:

A)  $y = -x + 2$

B)  $y = 2x + 10$

C)  $y = -3x - 12$

④ Determine the slope and both intercepts

for this equation in standard form:

A)  $2x - y = 8$

B)  $3x + 2y = 6$

C)  $x - 4y = -12$

⑤ Graph this equation using the intercepts:

A)  $x + 3y = 6$

B)  $2x - 3y = 12$

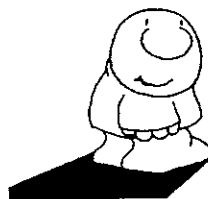
C)  $5x + 2y = -10$

⑥ Change this equation to slope-intercept form:

A)  $x - 3y = 9$

B)  $2x + 5y = -10$

C)  $3x - 2y = 6$



er... PLEASE LEAVE  
THIS NEWSPAPER  
PAGE OPEN...  
IT GETS AWFULLY  
DARK IN HERE WHEN  
YOU CLOSE IT!!

UNIT 16: SKILL MASTERY

# Linear Systems

Solve by graphing:

① A)  $3x + 2y = 12$   
 $y = x + 1$

B)  $x - 2y = -4$   
 $y = -x + 8$

C)  $2x + y = 6$   
 $y = 2x - 2$

⑤ A)  $4x + 2y = -4$   
 $2x + 5y = 14$

B)  $3x - 2y = 1$   
 $5x - 3y = 1$

C)  $2x - 3y = -7$   
 $3x - 4y = -8$

Solve by substitution:

② A)  $x = 3$   
 $3x - 2y = 5$

③ A)  $x + 2y = 7$   
 $2x - 5y = -4$

B)  $y = -2$   
 $2x + 3y = 4$

B)  $3x + y = 3$   
 $2x + 5y = -11$

C)  $x = -4$   
 $2x - 5y = 2$

C)  $x - 2y = 8$   
 $4x - 3y = 7$

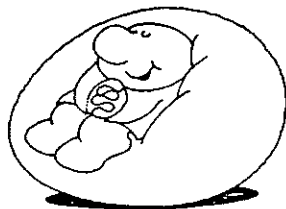
Solve by elimination:

④ A)  $3x - 2y = 2$   
 $4x - 3y = 4$

B)  $5x + 4y = 11$   
 $2x - 3y = 9$

C)  $3x + 5y = 3$   
 $2x - 2y = -14$

...IF IT WASNT FOR  
 PROCRASTINATION  
 I'D HAVE NOTHING TO  
 LOOK FORWARD TO  
 TOMORROW!!



Set up a chart and system of equations. Solve:

⑥ A) A boat travels downstream 64 miles in 4 hours. The return trip upstream takes twice as long. Find the rate of the boat and the rate of the current.

B) A plane flies 720 miles with a tailwind in two hours. Against the wind, a trip of the same distance takes an hour longer. Determine rate of the plane and the rate of the wind.

C) A boat travels 24 miles down stream in 2 hours. Upstream, the boat can go only half that distance in the same amount of time. Determine the rates of the boat and current.

## UNIT 17: SKILL MASTERY

# Factoring

Factor each expression completely. Show all steps:

① A)  $9x^2 - 16y^2$

B)  $25a^2 - 49b^2$

C)  $64x^2 - 1$

② A)  $x^2 + 3x - 18$

B)  $a^2 - a - 42$

C)  $x^2 - 2xy - 8y^2$

③ A)  $a^2b^2 - a^2b$

B)  $3x^3y + 6x^2$

C)  $2ab^3 - 6a^2b^2$

④ A)  $a^4 - 1$

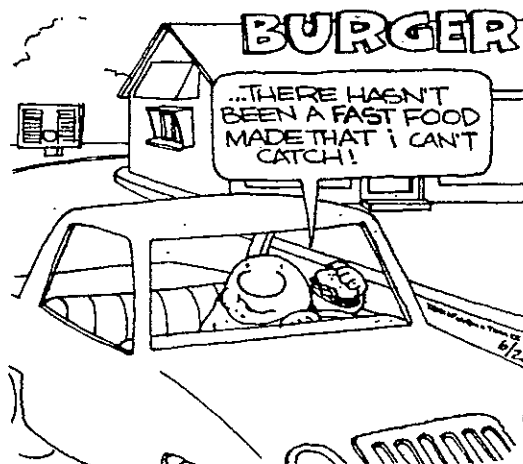
B)  $81x^4 - y^4$

C)  $a^4 - 16b^4$

⑤ A)  $2a^2 + 5a - 12$

B)  $3x^2 + 14x + 8$

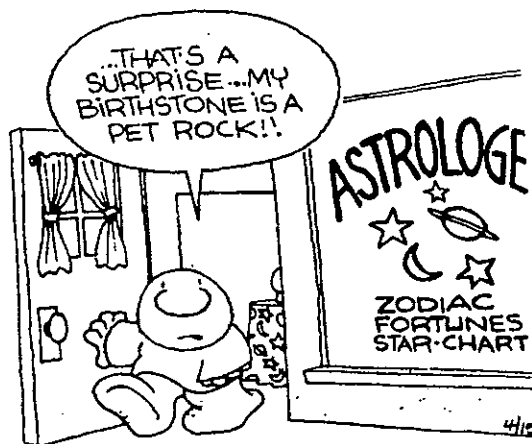
c)  $6x^2 - 7x + 2$



⑥ A)  $6x^2 - 7xy + 2y^2$

B)  $2a^2 - 11ab + 12b^2$

C)  $10x^2 + xy - 2y^2$



# Quadratic Equations

Solve by factoring:

① A)  $4x^2 - 9 = 0$

B)  $x^2 - 16 = 0$

C)  $9x^2 - 25 = 0$

Solve by completing the square:

② A)  $x^2 - 4x + 1 = 0$

B)  $x^2 + 2x - 4 = 0$

C)  $x^2 - 6x + 2 = 0$

③ A)  $2x^2 - 16x + 26 = 0$

B)  $3x^2 + 18x + 21 = 0$

C)  $4x^2 - 8x - 16 = 0$

Solve by using the quadratic formula:

④ A)  $x^2 - 6x + 6 = 0$

B)  $x^2 + 4x - 1 = 0$

C)  $x^2 + 2x - 2 = 0$

Solve using any method. Define a variable, write an equation, and show all steps:

⑤ Find the dimensions of a rectangle that has:

A) a length two more than three times its width and an area of  $33 \text{ in}^2$

B) a length three less than twice its width and an area of  $20 \text{ in}^2$

C) a length five less than four times its width and an area of  $21 \text{ in}^2$

⑥ Find the integers:

A) The square of a positive odd integer is added to the next consecutive odd integer. The sum is fourteen.

B) The sum of the squares of two consecutive integers is thirteen.

C) An even integer is added to the square of the next consecutive even integer and the sum is forty.