Today's Date: August 26

Today's birthday: Katherine

Lesson 23 – 29

(1) Expand $(2x-4)^5$

$= (2x)^5 + 5(2x)^4(-4)^1 + 10(2x)^3(-4)^2 + 10(2x)^2(-4)^3 + 5(2x)^1(-4)^4 + (-4)^5$

$= 32x^5 - 320x^4 + 1280x^3 - 2560x^2 + 2560x - 1024$

(2) $x^2 + 6x + 9, x = 3$

$3^2 + 6(3) + 9$

$9 + 18 + 9 = 36$ ←

(3)



Mrs. K brings 3 pies to the school picnic. Each pie is divided into 8 slices. There are 19 children from her class attending the picnic. How many slices are left if each child has one slice of pie?

$8 \times 3 = 24$ slices

$24 - 19 = 5$

Remainder = 5 slices

(4) $\sum_{k=0}^{3}(7-3k)$

$\sum_{k=0}^{3}(7-3k) = (7-3(0)) + (7-3(1)) + (7-3(2)) + (7-3(3))$

$= 7 + 4 + 1 - 2 = 10$

(5) $-4(-2-x) = 5x+6$

$8 + 4x = 5x + 6$

$2 + 4x = 5x$

$2 = x$

(6) $V = \frac{1}{3}\pi r^2 h$

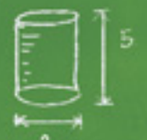


$= \frac{1}{3}\pi (4)^2 (3)$

$= \frac{1}{3}\pi\ 48$

$= 16\pi$

(7)



$V = \pi r^2 h$

$= \pi (1)(5)$

$= 5\pi$

(8) $x^2 = 5x - 4$

$x^2 - 5x + 4 = 0$

$(x-1)(x-4) = 0$

$x = 1$ or 4

(9) $(5x^2 + 4x - 6) - (3x^2 - x +$

$= 5x^2 + 4x - 6 - 3x$

$= (5x^2 - 3x^2) + (4x + x) + (-6$

$= 2x^2 + 5x - 8$

Review

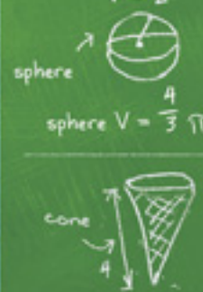
Example 1

$4x^4(3x^2 + x - 1) =$

$4x^4(3x^2) + 4x^4(x) - 4x^4(1)$

$= 12x^6 + 4x^5 - 4x^4$

Find the volume of an ice cream cone:



sphere $V = \frac{4}{3}\pi r^3$

cone $V = \frac{1}{3}\pi r^2 h$

Homework – Chapter 31

Reading pages: 211 215

Problems: #2, #3, #12, #15, #18, #22–26

*Due Wednesday

*** Extra Credit ***

Calculate the trajectory of a rocket (A) travelling to the Moon (B) by the most direct route through space.



At what time will the rocket reach the moon?

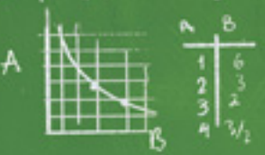
Departure time: 0600

Speed: 25,000 miles per hour

See p. 216 for additional information.

Example 2

Graph the following.





$m = -\frac{K}{B}$; $K = 6$

$x = x_0 + v_0 t + \frac{1}{2} a t^2$

$x_0 = 3m, v_0 = 4\frac{m}{s}, a = 2\frac{m}{s^2}$,

$t = 2s$

$x = 3\,m + (4\frac{m}{s})(2s) + \frac{1}{2}(2\frac{m}{s^2})(2s)^2$

$= 3m + 8m + 4m =$ 15 m



Area under the curve

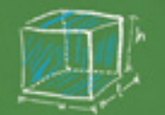
Approximate area $= \frac{2}{3}BH$

Area $= \int_a^b f(x)\,dx$

Circumference $= 2\pi r$

area $= \pi r^2$





cube

rectangular prism

$p = mv$

$m = 3kg$ $v = 4\frac{m}{s}$

$p = 12\ kg \cdot \frac{m}{s}$

$F = ma$

$F = (3\,kg)(4\frac{m}{s^2})$

$= 12\,N$

$6 - 4(-2 - x) = 5$

$6 + 8 + 4x = 5x$

$14 = x$

$\begin{bmatrix} 2 & 3 & 1 \\ 3 & -1 & -3 \\ 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 7 \\ 4 \\ 1 \end{bmatrix}$







by Katherine

For Katherine, her daughters,
and all who look to the stars
—H. B.

For Madeline, Audrey, and Sabrina –
all this and more
—D. P.

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Counting on KATHERINE



Illustrated by

HELAINE BECKER DOW PHUMIRUK

MACMILLAN CHILDREN'S BOOKS

Katherine loved to count.



She counted the steps to the road.

The steps up to church.

The number of dishes and spoons she washed in the bright white sink.


The only things she didn't count were the stars in the sky. Only a fool, she thought, would try that!

Even so, the stars sparked her imagination.

What was out there?

Katherine yearned to know as much as she could about numbers, about the universe – about everything!

Katherine's boundless curiosity turned her into a star student. She was so bright, she skipped three whole school years. She catapulted right past her brother! (He wasn't too happy about that.)



By the time she turned ten,
Katherine was ready for high school.



But back then, America was
legally segregated by race.





Her town's high school didn't
admit black students – of any age.

Katherine burned with fury.
She wanted, more than anything,
to keep learning. There was still
so much to know.





"Count on me,"
Katherine's father told her.

By working night and day, he earned enough money
to move the family to a town with a black high school.

WHITE SULPHUR SPRINGS,
WEST VIRGINIA

INSTITUTE,
WEST VIRGINIA



Katherine loved high school. She was good at every subject, but maths was still her favorite. She dreamed of becoming a research mathematician, making discoveries about the number patterns that are the foundations of our universe.

In those days, though, there were no jobs as research mathematicians for women. Professions most available to them were teaching and nursing.

So Katherine became a primary school teacher. She liked her job. And she loved her students. But she never stopped dreaming about exploring numbers.

In the 1950s, the US government's National Advisory Committee on Aeronautics (NACA) hired thousands of new employees. It even started hiring black women – as mathematicians.

Katherine heard about the mathematician jobs. Her heart raced with excitement – perhaps her dream could come true after all.

But when she applied for one of the positions, she was told they were already filled. Katherine had to wait a whole year until new spots opened up. Her patience paid off. She got the job.

