

ANSWERS

Shading indicates that the puzzle is for partners.

Section 11 Answers

WHY ISN'T A SNOWMAN VERY SMART?

- | | | |
|----------------|--------------------|---------------------|
| 1a. n^5 | 6a. m^5 | c. $5m^7$ |
| b. n^{11} | b. $\frac{1}{m^5}$ | d. $\frac{1}{5m^7}$ |
| c. $10n^6$ | | |
| d. $10n^{11}$ | | |
| 2a. y^6 | 7a. t^{11} | c. $24t^4$ |
| b. y^{10} | b. $t^6 + t^5$ | d. $3t + 8t^3$ |
| c. $49y^4$ | | |
| d. $125y^{12}$ | | |
| 3a. v^3 | 8a. $225k^2$ | c. $32k^{30}$ |
| b. v^5 | b. $30k$ | d. $64k^{30}$ |
| c. $4v^7$ | | |
| d. $4v$ | | |
| 4a. $10a^6$ | 9a. $7x^5$ | c. $\frac{x^5}{7}$ |
| b. $7a^3$ | b. $\frac{7}{x^5}$ | d. $\frac{1}{7x^5}$ |
| c. $36a^{16}$ | | |
| d. $13a^8$ | | |
| 5a. $64a^3$ | 10a. w^6 | c. w^{12} |
| b. $12q$ | b. $-w^9$ | d. $-w^{15}$ |
| c. q^{12} | | |
| d. $4q^3$ | | |

HE HAS SNOW BRAINS

11.1

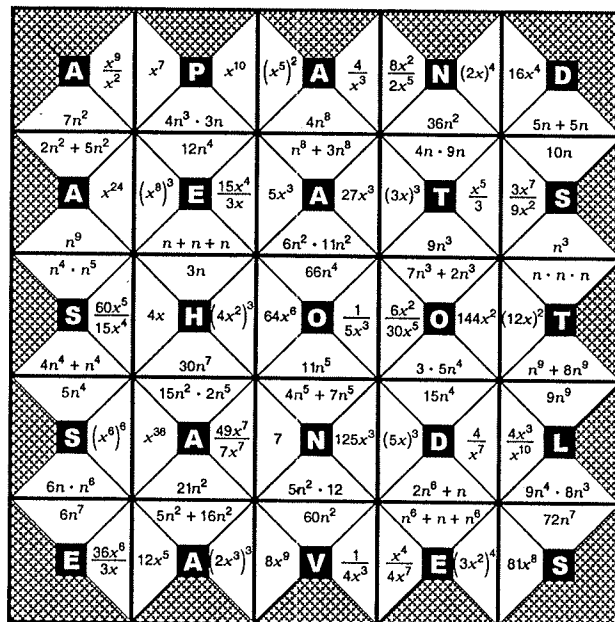
What Do You Call a Bar of Soap That Doesn't Clean?

- | | | |
|----------------|-----------------------|--------------------|
| 1. x^7 | 7. a^4b^4 | 13. $-5m^{11}t^2$ |
| 2. $7x^4$ | 8. $6a^2b^6$ | 14. $-60m^4t^6$ |
| 3. $12x^5$ | 9. $-36a^6b^3$ | 15. $77m^5t^{10}$ |
| 4. x^{13} | 10. $-8a^4b^3$ | 16. $6m^6t^5$ |
| 5. $30x^9$ | 11. $14a^5b^7$ | 17. $16m^5t^8$ |
| 6. x^{11} | 12. $-36a^3b^7$ | 18. $-60m^8t^6$ |
| 19. n^6 | 25. $9x^4y^6$ | 31. $50k^5d^3$ |
| 20. n^{10} | 26. $125x^{12}y^3$ | 32. $-81k^2d^{11}$ |
| 21. $25n^{16}$ | 27. $49x^{10}y^4$ | 33. $-k^3d^4$ |
| 22. $-8n^{12}$ | 28. $-64x^3y^{24}$ | 34. $-16k^6d^2$ |
| 23. $1000n^3$ | 29. $-32x^{10}y^{15}$ | 35. $k^{17}d^{17}$ |
| 24. $81n^{36}$ | 30. $81x^{28}y^8$ | 36. k^8d^6 |

A RUBBA DUB DUD

11.3

Why Did the Panda Eat Dinner At the Shanghai Diner, Then Fire a Basketball Into the Trash Can Before Walking Out?



A PANDA EATS SHOOTS AND LEAVES **11.2**

How Does the King's Son Write?

- | | |
|----------------------|-------------------------|
| 1a. $9x^6$ | 5a. $10p^{11}q^5$ |
| b. $20x^5$ | b. $-72p^{16}q^3$ |
| c. $24x^5$ | c. $72p^5q^{10}$ |
| d. $-6x^{10}$ | d. $-72p^{10}q^8$ |
| 2a. $49n^6$ | 6a. $64u^6t^8$ |
| b. $-64n^{24}$ | b. $16u^{16}t^{23}$ |
| c. $625n^{16}$ | c. u^4t^6 |
| d. $64n^{12}$ | d. $-u^{10}t^8$ |
| 3a. $16m^{14}d^4$ | 7a. $27a^9b^{22}c^{17}$ |
| b. $81m^8d^6$ | b. $a^5b^{12}c^{14}$ |
| c. $-m^6d^{15}$ | c. $-88a^4b^4c^5$ |
| d. $81m^4d^{36}$ | d. $a^{12}b^6c^{10}$ |
| 4a. $75x^5y^3$ | 8a. $15k^{17}v^{10}$ |
| b. $-56x^3y^7$ | b. $40k^{15}v^9$ |
| c. $100x^{18}y^{11}$ | c. $15k^9v^8$ |
| d. $-9xy^{19}$ | d. $-k^9v^9$ |

HE PRINCE

11.4

Why Was the Deck of Cards Always in Trouble?

1a. $4x^2$ 1b. $-4x^3$

2a. $2m^3n$ 2b. $5m^8n^4$

3a. $\frac{2b^3}{a^3}$ 3b. $-\frac{a^2}{2b^5}$

4a. ke 4b. ke^3

5a. $\frac{9c^5}{2d}$ 5b. $\frac{d^2}{5c^5}$

6a. $\frac{64x^2}{y^6}$ 6b. $-\frac{x^{15}}{8y^6}$

7a. $\frac{4a^2b^6}{c^4}$ 7b. $a^3b^9c^6$

8a. $-5v$ 8b. $5t^5$

9a. $\frac{1}{w^3h^2}$ 9b. $-\frac{1}{w^3}$

10a. $\frac{25q^4}{16p^4}$ 10b. $-\frac{27q^{12}}{p^3}$

11a. 16 11b. $\frac{n^2}{5}$

12a. $\frac{a^{3x}}{7^x b^{2x}}$ 12b. $\frac{a^{x^2}}{b^{xy}}$

THE JOKERS WERE WILD

11.5

What Did Professor Utterbunk Say When Asked: Have You Ever Heard of the Planet Saturn?

1. 125 17. $7a$

2. $\frac{1}{125}$ 18. $\frac{7a}{b^4}$

3. $\frac{1}{243}$ 19. $\frac{7b^4}{a}$

4. $-\frac{1}{125}$ 20. $\frac{ab}{49}$

5. $\frac{1}{144}$ 21. $\frac{2x^3}{y^8}$

6. $-\frac{1}{144}$ 22. $\frac{2y^8}{x^3}$

7. 1 23. $\frac{1}{2x^3y^8}$

8. $-\frac{1}{64}$ 24. $3n^2t^5$

9. $-\frac{1}{64}$ 25. $\frac{81t^5}{n^2}$

10. $\frac{1}{100,000}$ 26. $\frac{n^2}{81t^5}$

11. $-\frac{1}{100,000}$ 27. $\frac{64}{5cd^6}$

12. 1 28. $320d^6$

13. $\frac{1}{75}$ 29. $\frac{c}{320d^6}$

14. $-\frac{1}{75}$ 30. $-\frac{5}{64c}$

15. $\frac{1}{16}$ 30. $-\frac{5}{64c}$

16. $-\frac{1}{16}$ 30. $-\frac{5}{64c}$

I'M NOT SURE BUT IT HAS A FAMILIAR RING

11.6

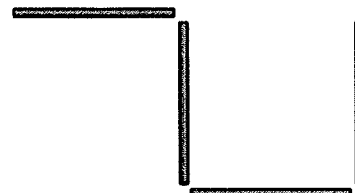
TOOTHPICK TRICK

Arrange 4 toothpicks or matches on the projector as shown at the right. Challenge students: Can anybody make a perfect square by moving just one toothpick? Naturally a volunteer will come up and move the top toothpick to complete a square. You give cheers.

Then you say: OK, can anybody do it a different way?

Eventually somebody may come up with the solution at the right.

The number "4" is a perfect square.



extra for teachers

What Did People Say After Two Satellite Dishes Got Married?

- | | | | | |
|-----------------------|------------------------|-----------------------|------------------------|--------------------------|
| A. 512 | B. $\frac{1}{512}$ | E. -512 | L. $-\frac{1}{512}$ | I. 625 |
| T. $\frac{1}{625}$ | E. $-\frac{1}{625}$ | D. 1 | T. $\frac{1}{81}$ | N. $-\frac{1}{81}$ |
| U. $\frac{5a}{b^3}$ | W. $\frac{125}{a^3b}$ | D. $\frac{ab^3}{125}$ | H. $\frac{16}{b^8}$ | S. $\frac{a}{16b^8}$ |
| W. $\frac{k^5}{7n^2}$ | L. $\frac{n^2}{49k^5}$ | G. $\frac{1}{343n^2}$ | D. $\frac{n^2}{98k}$ | U. $-\frac{n^2k^5}{98}$ |
| O. 343 | E. $\frac{1}{343}$ | A. -343 | H. $-\frac{1}{343}$ | T. 400 |
| E. $\frac{1}{400}$ | A. $-\frac{1}{400}$ | S. 1 | E. $\frac{1}{256}$ | I. $-\frac{1}{256}$ |
| T. $\frac{9a}{b^2}$ | E. $\frac{81}{a^2b}$ | T. $\frac{ab^2}{81}$ | W. $\frac{64}{b^{10}}$ | R. $\frac{a}{64b^{10}}$ |
| G. $\frac{k^8}{6n^3}$ | N. $\frac{n^3}{36k^8}$ | C. $\frac{1}{216n^3}$ | R. $\frac{n^3}{144k}$ | P. $-\frac{n^3k^8}{144}$ |

THE WEDDING WAS DULL BUT
THE RECEPTION WAS GREAT

11.7

What Is Special About a Radioactive Cat?

- | | |
|-------------------------|----------------------------|
| 1. 3.45×10^6 | 13. 7.2×10^4 |
| 2. 7.7×10^{-4} | 14. 7.2×10^{12} |
| 3. 7 | 15. 7.2×10^{-7} |
| 4. 11 | 16. 4.19×10^7 |
| 5. -5 | 17. 4.19×10^{-3} |
| 6. -11 | 18. 4.19×10^{-11} |
| 7. 380,000 | 19. 2.22×10^4 |
| 8. 0.000038 | 20. 2.22×10^7 |
| 9. 38,000,000 | 21. 5.4×10^{-5} |
| 10. 62,500 | 22. 5.4×10^{-14} |
| 11. 0.00625 | |
| 12. 0.0000000625 | |

IT HAS EIGHTEEN HALF LIVES

11.8

Why did the math student choose
for his computer password:
MICKEYMINNIEGOOFYPLUTO?
He heard that it had to have at
least four characters.

extra for teachers

What Did Mr. Cabinetmaker Say To Mrs. Cabinetmaker?

- | | | |
|-------------------------|---------------------------|-----------------------------|
| D. x^3 | E. $\frac{1}{x^3}$ | F. x^6 |
| E. $12x^5$ | D. $\frac{14}{x^2}$ | T. $\frac{30}{x^{12}}$ |
| I. $-10x^5$ | N. $\frac{8}{x^6}$ | E. $-45x^3$ |
| O. -36 | W. $\frac{30}{x^4}$ | N. $-\frac{64}{x^8}$ |
| R. $18a^5b^5$ | O. $-\frac{8b^{11}}{a^2}$ | F. $\frac{48b^{13}}{a}$ |
| O. $20a^4b^7$ | R. $48b^3$ | H. $12a^3$ |
| S. $\frac{12a^3}{b^7}$ | U. $-\frac{20b^6}{a}$ | O. $-\frac{100}{a^{12}b^3}$ |
| E. $-\frac{49}{a^6b^3}$ | M. $\frac{18}{a^3b^{17}}$ | R. $-8a^6b^8$ |
| E. 6×10^7 | O. 3.6×10^5 | V. 7.2×10^{-7} |
| S. 2.4×10^8 | H. 2.5×10^{-6} | R. 2.4×10^{-10} |
| E. 3.6×10^4 | S. 7.2×10^{-19} | |
| U. 1.5×10^8 | L. 1.6×10^{13} | |

WE NEED TO FIND
MORE HOURS FOR
OUR SHELVES

11.9

How Did the Absent-Minded Professor Burn His Ear?

- | | |
|-----------------------------|-------------------------|
| E. n^7 | N. $49d^2$ |
| N. n^{10} | H. $64d^6$ |
| H. $\frac{1}{n^{10}}$ | S. $-64d^6$ |
| A. n^{39} | A. $\frac{1}{64d^6}$ |
| O. $\frac{1}{n^4}$ | O. $25d^8$ |
| I. $\frac{1}{n^{16}}$ | E. $-64d^7$ |
| E. n^{76} | H. $\frac{1}{81d^{29}}$ |
| I. $x^{10}y^8$ | N. $36m^{14}t^8$ |
| N. $1000x^5y^6$ | R. $27m^6t^4$ |
| H. $-x^9y^{24}$ | W. $16m^4t^6$ |
| E. $x^{12}y^{10}$ | G. $-225m^7t^{12}$ |
| G. $81y^2$ | N. $\frac{256}{m^4t^4}$ |
| T. $\frac{81y^{12}}{x^2}$ | P. $30m^2t^2$ |
| W. $-\frac{125x^8}{y^{13}}$ | R. 1 |

HE WAS IRONING WHEN THE PHONE RANG

11.10

Why Were the Bones Chasing the Skull?

- | | | |
|-----------------------------|--------------------------|-----------|
| E. 5.9×10^{12} mi | | |
| T. 6.02×10^{24} kg | | |
| A. 1.28×10^{-10} m | | |
| H. 9.1×10^{-28} g | | |
| O. 7.25×10^6 | A. 7.25×10^4 | |
| E. 3.83×10^{-3} | T. 3.83×10^{-5} | |
| A. 6×10^{15} | D. 1.3×10^8 | H. 10 |
| D. 1.9×10^4 | Y. 6.4×10^{-6} | N. 1000 |
| E. 9.9×10^{-11} | T. 3.5×10^{12} | E. 10,000 |
| T. 6.84×10^{-3} | W. 4×10^3 | G. 2 |

THEY WANTED TO GET A HEAD

11.12

How Would You Describe a Window in the Kitchen Eating Area?

- | | | | |
|----------------------------|-------------------------------|--------------------------|--------------------------|
| 1. $\frac{a^5}{3}$ | 2. $\frac{2}{5a^7}$ | 7. $\frac{1}{x^2y^3}$ | 8. $\frac{x^4y^7}{27}$ |
| 3. $-\frac{1}{8a^7}$ | 4. $\frac{2}{a^9}$ | 9. $\frac{3}{x^7y^3}$ | 10. $-\frac{12y^3}{x^7}$ |
| 5. $\frac{2a}{3}$ | 6. $\frac{125}{a^9}$ | 11. $\frac{4x^2}{25y^8}$ | 12. $\frac{25y^8}{4x^2}$ |
| 13. $\frac{9t^{12}}{4m^2}$ | 14. $\frac{4m^2}{9t^{12}}$ | | |
| 15. $\frac{t^{21}}{64m^9}$ | 16. $\frac{1}{27m^{11}t^5}$ | | |
| 17. $-4m^4t^4$ | 18. $\frac{16m^{24}}{t^{20}}$ | | |
| 19. 3×10^{-4} | 20. 5×10^{11} | | |
| 21. 1.8×10^{-5} | 22. 5×10^{-9} | | |
| 23. 3×10^{11} | 24. 4.5×10^{-5} | | |
| 25. 2.5×10^5 | | | |
| 26. 2.7×10^5 | | | |

EXTRA:
3.125 days

A PANE IN THE NOOK

11.11

For Whom Was Mr. Bachelor Rabbit Searching?

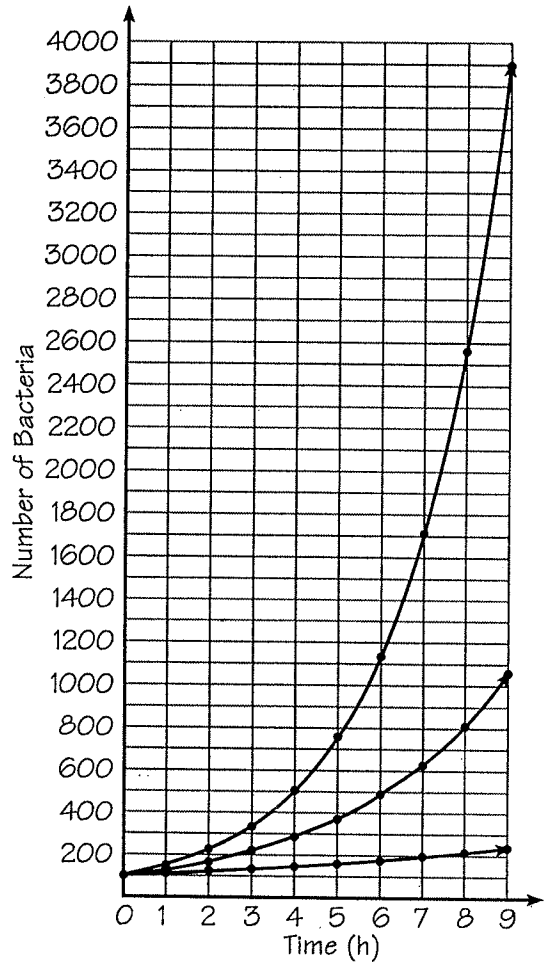
- | | | | |
|---------------------------|------------------------------|----------------------------|-------------------------------|
| I. $5n^5$ | E. $18n^5$ | 15. $18n^5$ | 5. $15n^9$ |
| T. $-\frac{24}{n^3}$ | S. $15n^9$ | 1. $-\frac{24}{n^3}$ | 9. $5n^5$ |
| O. $3x^5$ | H. $-\frac{6}{x^2}$ | 17. $5x^8$ | 13. $3x^5$ |
| U. $5x^8$ | A. $\frac{1}{3x^3}$ | 10. $\frac{1}{3x^3}$ | 2. $-\frac{6}{x^2}$ |
| E. $30c^3d^5$ | | 20. $12c^5d^4$ | |
| Y. $12c^5d^4$ | | 7. $30c^3d^5$ | |
| T. $36c^7d^7$ | | 12. $36c^8d^9$ | |
| S. $36c^8d^9$ | | 4. $36c^7d^7$ | |
| N. $\frac{16t^{12}}{a^4}$ | A. $\frac{81a^8}{t^{12}}$ | 3. $\frac{81a^8}{t^{12}}$ | 11. $\frac{64t^{18}}{a^6}$ |
| L. $\frac{64t^{18}}{a^6}$ | M. $\frac{729t^{12}}{64a^6}$ | 18. $\frac{16t^{12}}{a^4}$ | 14. $\frac{729t^{12}}{64a^6}$ |
| P. $\frac{30x^4}{y^5}$ | | 8. $-\frac{30x^6}{y}$ | |
| N. $64x^3y^4$ | | 16. $64x^6y^{10}$ | |
| C. $-\frac{30x^6}{y}$ | | 6. $\frac{30x^4}{y^5}$ | |
| B. $64x^6y^{10}$ | | 19. $64x^3y^4$ | |

THAT SPECIAL SOMEBUNNY

11.13

What Did Dr. Frug's Wife Say When Dr. Frug Said He Needed to Spend More Time Studying Bacteria?

t	A	B	C
0	100	100	100
1	110	130	150
2	121	169	225
3	133	220	338
4	146	286	506
5	161	371	759
6	177	483	1139
7	195	627	1709
8	214	816	2563
9	236	1060	3844



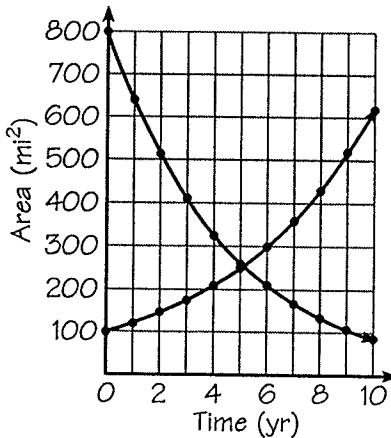
OH DON'T BACILLI

11.14

WHAT'S THE BEST WAY TO SERVE LION MEAT?

Situation #1

t	R	F
0	800	100
1	640	120
2	512	144
3	410	173
4	328	207
5	262	249
6	210	299
7	168	358
8	134	430
9	107	516
10	86	619



Equations:

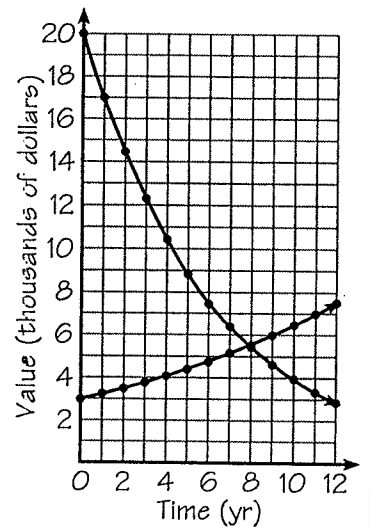
$$R = 800(0.8)^t$$

$$F = 100(1.2)^t$$

AS A MANE DISH

Situation #2

t	V _C	V _S
0	20,000	3000
1	17,000	3240
2	14,450	3499
3	12,283	3779
4	10,440	4081
5	8874	4408
6	7543	4761
7	6412	5141
8	5450	5553
9	4632	5997
10	3937	6477
11	3347	6995
12	2845	7555



Equations:

$$V_C = 20,000(0.85)^t$$

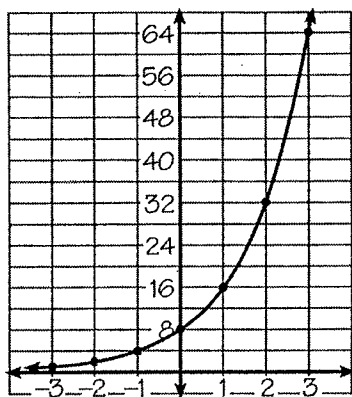
$$V_S = 3000(1.08)^t$$

11.15

What Is The Scientific Name for The Study of Shopping?

Part 1

x	y
-3	1
-2	2
-1	4
0	8
1	16
2	32
3	64



Part 2

x	y
0	20
1	18
2	16.2
3	14.6
4	13.1
5	11.8

Part 3

Q	Value
0	500.00
1	510.00
2	520.20
3	530.60
4	541.22
5	552.04
6	563.08
7	574.34
8	585.83

Part 4

21. \$12,000
22. \$96,000

Part 5

23. 50 g
24. 6.25 g

BUYOLOGY

11.16

extra for teachers

SPECIAL DATES

On the first school day after winter break, start the class by doing a 360° spin. If your students can't figure out what you're doing, you explain: It's my NEW YEAR'S REVOLUTION!

On March 4, tell your students that you had been thinking about giving them a free day with no work at all. But then you noticed the date, and you realized that:

No! Today we must MARCH FORTH!

On May 4, be sure to give best wishes to all your students:

MAY THE FOURTH BE WITH YOU!

WORLD'S WORST MOTH JOKE

WHAT HAPPENED TO THE MOTH THAT FLEW INTO THE TWO-YEAR-OLD'S BIRTHDAY PARTY?

He burned his end at both candles.

extra for teachers

REMEMBER: NOBODY SHOULD GO ALGEBRALESS!

extra for teachers

Section 12 Answers

What Happened After a Bunch of Izzy Lang's Friends Made a Giant "Happy 85th Birthday" Banner for Him?

- | | |
|----------------------|-----------------------|
| I. $7n^2$ | D. $-13k^3 + 4k^2$ |
| L. $10n^4$ | O. $144k^8$ |
| G. $7n^3 + n^2 + 4n$ | E. $20k^5$ |
| E. $28n^6$ | Y. $-k^6$ |
| S. $-7n^4 + 2n^2$ | L. $-35k^9$ |
| C. $-36n^{10}$ | N. $24k^{10} - 24k^9$ |
| A. $10a + 3b$ | A. $11x^3y$ |
| T. $30ab$ | G. $-10x^3y^4$ |
| D. $3ab^2$ | T. $40x^6y^4$ |
| I. $-10a^2b^4$ | S. $2x^5y^5$ |
| L. $5ab^2 - 2a^2b$ | N. $-x^5y^5 + x^4y^4$ |
| H. $-10a^3b^3$ | L. 0 |

THEY CALLED IT OLD LANG'S SIGN

12.1

Did You Hear About ...

THE BOY ANT AND THE GIRL ANT WHO GOT TOGETHER AND BECAME PAIR ANTS?

- | | |
|-----------------------------|---------------------|
| 1. $4u - 4$ | 2. $8u^2 - 12$ |
| 3. $9u^2 + 17u$ | 4. $-8u^2 + 9u - 7$ |
| 5. $-11u^2 - 5u - 10$ | 6. $9u^2 - u + 11$ |
| 7. $6u^2 + 2u + 15$ | |
| 8. $4x^2 + 5x + 28$ | |
| 9. $9x^3 - 3x^2$ | |
| 10. $3x^3 - 5x^2 + 2x - 14$ | |
| 11. $3x^4 + 4x^2 + 5x - 8$ | |
| 12. $3x^4 - 7x^3 + 9x^2$ | |
| 13. $-3x^2 + 3xy + 6y^2$ | |
| 14. $12x^2 - 40y^2$ | |

12.3

WHY WAS THE PROFESSOR FIRED EVEN THOUGH HIS RESEARCH WAS VAST?

His teaching was only half-vast.

extra for teachers

Why Did the Grizzly Go On a Diet?

- | | |
|-----------------------------|--------------------|
| 1. $15n + 3$ | 2. $13n^2 - 17$ |
| 3. $13n^2 - 3n$ | 4. $6n^2 + 6n - 3$ |
| 5. $12n^2 - 9n + 6$ | 6. $-8n^2 + 10$ |
| 7. $17a^2 + 3$ | |
| 8. $4a^2 + 6a + 7$ | |
| 9. $-7a^2 - 13a - 19$ | |
| 10. $-2a^2 + 9a + 10$ | |
| 11. $11a^3 - 3a - 13$ | |
| 12. $-3a^3 - 6a^2 - a$ | |
| 13. $-5x^4 - 3x^2 - 12$ | |
| 14. $-5x^4 + 3x^2 - 4x - 1$ | |
| 15. $-x^4 + 3x^3 + x + 12$ | |
| 16. $4x^2 - 7xy + 3y^2$ | |
| 17. $-16x^2 + 10xy$ | |
| 18. $14x^2y - 8xy^2$ | |

HE HAD A BIG BEAR BELLY

12.2

What's Wrong With Camping On the Sahara Desert?

- | | |
|--------------------------|---------------------------|
| E. $10n - 6$ | 8. $7n^2 + 13$ |
| S. $9n^2 - 15n$ | 13. $10n - 6$ |
| T. $7n^2 + 4n - 7$ | 1. $7n^2 + 4n - 7$ |
| I. $7n^2 + 13$ | 16. $9n^2 - 15n$ |
| T. $3k + 9$ | 2. $2k + 8$ |
| E. $7k^2 + 5k + 10$ | 10. $11k^2 - 7k - 11$ |
| H. $2k + 8$ | 5. $7k^2 + 5k + 10$ |
| I. $11k^2 - 7k - 11$ | 15. $3k + 9$ |
| T. $5x^3 + 5x^2 - 9x$ | 3. $8x^4 + 3x^2 + 6$ |
| E. $8x^4 + 3x^2 + 6$ | 11. $6x^3 + 4x^2 + 2x$ |
| N. $6x^3 + 4x^2 + 2x$ | 7. $5x^3 + 5x^2 - 9x$ |
| S. $-3x^2 - 13xy - 6y^2$ | 9. $-3x^2 - 13xy - 6y^2$ |
| A. $3a^3 + 11a^2 + 7a$ | |
| N. $5a^3 + 9a^2 - 7a$ | |
| H. $-7a^2 + 4ab - 10b^2$ | |
| T. $-9a^2 - 11ab + 4b^2$ | |
| | 14. $5a^3 + 9a^2 - 7a$ |
| | 6. $3a^3 + 11a^2 + 7a$ |
| | 12. $-9a^2 - 11ab + 4b^2$ |
| | 4. $-7a^2 + 4ab - 10b^2$ |

THE HEAT IS IN TENTS

12.4

What Did the Boy Measuring Stick Say When He Saw the Girl Measuring Stick?

1. $14m^2 + 35$
2. $-24m^2 + 12m$
3. $2m^4 + 18m$
4. $-5m^3 - 6m^2$
5. $36a^2 - 9a + 18$
6. $36a + 15a^2 - 3a^3$
7. $-28a^4 - 60a^3 + 4a^2$
8. $12a^5 - 4a^4 + 6a^3$
9. $x^4y - x^2y^3$
10. $5x^4y^3 - 20x^2y^5$
11. $18x^3y^2 + 81x^2y^2 - 36x^2y^3$
12. $-5x^4y^2 + 8x^3y^3 - x^2y^4$
13. $6c^5d^4 - 15c^3d^6 - 54cd^8$
14. $24c^6d^5 + 80c^5d^5 + 88c^2d^2$
15. $-144c^{12}d^5 + 45c^9d^8$
16. $12c^7 - 80c^6d - 12c^5d^2$

I WANT TO METER

12.5

Law of the Donut

- | | |
|----------------------|--------------------------|
| S. $n^2 + 7n + 10$ | E. $15x^2 + 13x + 2$ |
| A. $n^2 + 13n + 36$ | A. $36x^2 - 44x + 8$ |
| E. $n^2 + 7n - 30$ | L. $18x^2 - 9x - 2$ |
| W. $n^2 - 11n + 30$ | E. $10x^2 + 27x - 28$ |
| O. $6n^2 + 22n + 16$ | O. $2x^2 + 17xy + 30y^2$ |
| A. $28n^2 + 13n - 5$ | H. $36x^2 - 25xy + 4y^2$ |
-
- | |
|------------------------------|
| M. $t^3 + 6t^2 + 5t - 6$ |
| T. $6t^3 - 5t^2 + 4t - 15$ |
| K. $8t^3 - 26t^2 + t + 2$ |
| H. $6t^3 - 11t^2 - 11t + 20$ |
| L. $8t^3 + 13t^2 + 66t - 27$ |
| V. $20t^3 - 7t^2 - 56t - 20$ |

TWO HALVES MAKE A HOLE

12.7

Mystery Message

- | | | |
|-------------------|--------------------------|------------------|
| E. $12x + 9$ | O. $3x^2 + 9x - 6$ | I. $12x - 20$ |
| S. $4x + 7$ | D. $5x + 5$ | A. $x^2 - 5x$ |
| E. $24x^2 - 15x$ | S. $2x^4 + 14x^3 + 8x^2$ | G. $7x^2$ |
| R. $116x^2 + 53x$ | W. $66x^3 + 40x^2 + 24x$ | R. $11x^2 - 44x$ |

Q'S ARE WEIRD O'S

12.6

Why Did the Girl Attorney Stop Dating the Boy Attorney?

- 1a. $x^2 + 5x + 6$
- b. $2x^2 + 9x + 4$
- c. $15x^2 + 26x + 8$
- 2a. $c^2 + 9c + 20$
- b. $c^2 + 11c + 18$
- c. $c^2 - 13c + 30$
- 3a. $k^2 + 5k - 24$
- b. $k^2 - 5k - 36$
- c. $k^2 - 9k + 14$
- 4a. $5n^2 + 28n + 32$
- b. $12n^2 + 7n - 10$
- c. $12n^2 - 16n - 3$
- 5a. $3x^2 + 7xy + 2y^2$
- b. $8x^2 - 26xy + 15y^2$
- c. $21x^2 - xy - 2y^2$
- 6a. $21t^2 - 62t + 16$
- b. $22t^2 + 23t - 15$
- c. $16t^2 + 56t - 15$
- 7a. $5a^2 + 2ab - 24b^2$
- b. $36a^2 + 10ab - 4b^2$
- c. $6a^2 - 7ab - 24b^2$

NOTE: Models for multiplying binomials and factoring trinomials appear on ANSWERS • 36.

HE LOST HIS APPEAL

12.8

WORLD'S WORST FROG JOKE

FROG (*telephoning the psychic hot line*): Can you tell my future?
 PSYCHIC: You are going to meet a beautiful woman who will be very curious about you.

FROG: That's great. Will I meet her at a party?

PSYCHIC: No, next semester in biology class.

extra for teachers

How Did the Dinosaur Feel Just Before the Big Algebra Test?

Set 1 14•O True

5•A True

19•D $n^2 - 11n + 28$

8•K $d^2 + 5d - 6$

16•S True

2•I $y^2 + 7y - 18$

11•E True

Set 2 6•S True

12•N $10t^2 + 13t + 4$

19•E True

4•S $12q^2 - 35q + 8$

8•A True

1•H True

10•T $36k^2 - 111k - 30$

Set 3 12•R True

20•D $6a^2 + 13ab - 5b^2$

2•E True

13•N $15x^2 - 46xy + 16y^2$

15•U True

9•T $15x^2 + 56xy - 16y^2$

4•W True

Set 4 20•X True

10•N True

7•H $30w^4 + 19w^2 - 4$

18•R True

10•T $2a^3 - a^2 + 14a - 7$

13•V True

17•L $x^4 + 8x^2y + 16y^2$

HE WAS A NERVOUS REX

12.9

What Kind of Pop Star Sings About Chocolate?

1. 4

2. 13

3. 9

4. 15

5. $11x + 15$

6. $2x^2 + 23x - 8$

7. $5x^2 - 6x + 3$

8. 12

9. 8

10. 7

11. $12x + 16$

13. $4x + 10$

12. 10 ft

14. 11 in.

A CANDY RAPPER

12.10

Why Did the Sports Announcer Say: "OH! OH! OH! OH! OH!"

E. $n^2 - 9$

B. $k^2 + 10k + 25$

I. $n^2 - 144$

G. $k^2 - 16k + 64$

N. $4n^2 - 81$

H. $k^2 + 30k + 225$

Y. $16n^2 - 1$

M. $9k^2 + 24k + 16$

H. $9n^2 - 100$

W. $81k^2 - 36k + 4$

A. $64 - n^2$

E. $64 + 80k + 25k^2$

O. $n^4 - 25$

L. $1 - 14k + 49k^2$

I. $4x^2 - 9y^2$

Y. $4a^2 + 20ab + 25b^2$

O. $25x^2 - y^2$

R. $a^2 - 12ab + 36b^2$

S. $49x^2 - 16y^2$

S. $100a^2 - 60ab + 9b^2$

T. $36x^2 - 121y^2$

P. $16a^2 + 120ab + 225b^2$

E. $x^4 - 4y^2$

D. $64a^2 - 128ab + 64b^2$

C. $100x^2 - y^6$

M. $81a^4 + 18a^2b^2 + b^4$

A. $9x^6 - 64y^4$

L. $49a^4 - 56a^2b + 16b^2$

HE WAS READING THE OLYMPIC SYMBOL

12.11

FOOD FOR THOUGHT

1. Why is EDAM cheese the most unusual kind of cheese?

IT IS MADE BACKWARDS

2. Why couldn't Zark see clearly after eating 18 Krispy Kreme donuts?

HIS EYES GLAZED OVER

1. $4n^2 + 3n - 27$

2. $4n^2 - 49$

3. $4n^2 - 28n + 49$

4. $x^3 + 8x^2 + 15x$

5. $3x^3 - 48x$

6. $2x^3 + 20x^2 + 50$

7. $3k^4 - 13k^3 + 10k^2$

8. $80k^3 - 24k^2 - 32k$

9. $32k^3 - 162k$

10. $24d^4 + 44d^3 - 8d^2$

11. $36d^3 + 72d^2 - 189d$

12. $25d^5 - 20d^4 + 4d^3$

13. $x^3y + 7x^2y^2 + 10xy^3$

14. $3x^3y - 11x^2y^2 - 4xy^3$

15. $20x^3y - 45xy^3$

16. $28a^4 - 15a^3b + 2a^2b^2$

17. $3a^2b^2 + 75ab^3 + 24b^4$

18. $a^4b^2 + 2a^3b^3 + a^2b^4$

19. $18t^3u - 200tu^3$

20. $12t^3u^2 + 59t^2u^3 - 5tu^4$

21. $7t^4u - 28t^3u^2 + 28t^2u^3$

12.12

Section 13 Answers

Why Did the Backpacker Carry a Flashlight?

- | | |
|---------------------|-----------------------------|
| E. 5 | D. $2ab$ |
| O. x | E. a^2b |
| A. $4x$ | H. $9a^3$ |
| H. x^2 | A. $3b^2$ |
| T. $8x$ | I. a^2b^2 |
| S. $10x^2$ | N. $15ab^3$ |
| O. $2t + 3$ | W. $8a + 3b$ |
| T. $2t - 9$ | D. $3b - 10a$ |
| E. $3t + 4$ | G. $a^3b^3 + 7a^2b^4$ |
| I. $6t - 11$ | N. $5a^2 - 15b^2$ |
| H. $2t^2 + 9t - 5$ | L. $2a^4b^4 + 5a^2b^2 + 1$ |
| L. $3t^2 + 20t - 1$ | T. $5a^2b - a^2b^2 - 2ab^3$ |

HE WANTED TO LIGHTEN HIS LOAD **13.1**

WHERE DOES THE SMELL OF A SKUNK GO?

1. $(x + 2)(x + 3)$
2. $(x + 1)(x + 4)$
3. $(x + 3)(x + 5)$
4. $(x + 2)(x + 5)$
5. $(x + 1)(x + 8)$
6. $(x - 1)(x - 7)$
7. $(x - 2)(x - 6)$
8. $(n + 4)(n + 5)$
9. $(n - 2)(n - 9)$
10. $(n - 4)(n - 11)$
11. $(n + 3)(n + 8)$
12. $(n + 2)(n + 16)$
13. $(n - 3)(n - 25)$
14. $(n - 5)(n - 9)$
15. $(x + 2y)(x + 4y)$
16. $(x + 3y)(x + 9y)$
17. $(x - y)(x - 13y)$
18. $(x - 5y)(x - 8y)$
19. $(x + 4y)(x + 10y)$
20. $(x + 2y)(x + 18y)$
21. $(x - 10y)^2$

NO ONE NOSE

13.3

Why Didn't the Piano Work?

Set 1 a. $x(x - 6)$

- b. $2x(x + 4)$
- c. $5x(9x - 4)$
- d. $3x(3x^2 + 10)$
- e. $x^3(8x^2 - 15)$

Set 2 a. $4a(2a^2 + a + 3)$

- b. $7a^2(a^2 - 5a - 2)$
- c. $a^4(6a^4 + 10a^2 - 3)$
- d. $12a^3(3 - 2a + 5a^2)$
- e. $15a(2a^5 - 5a^4 - 1)$

Set 3 a. $m^2n(m + 9)$

- b. $5m^2n^2(2m - 5n)$
- c. $7mn^3(7m^4 + 4n)$
- d. $24n(3m^7 + 1)$
- e. $2m^3n^4(4 - 11m^2n^2)$

Set 4 a. $20(2x^2 - 5xy - 4y^2)$

- b. $3x^3y^2(4x^2 + 3x - 2)$
- c. $5xy(3x^2 - 7xy + 8y^2)$
- d. $9x^2(16x^6y^2 + 3x^2y + 1)$
- e. $\pi(2x^2 - y^2)$

IT KNOWS ONLY HOW TO PLAY

13.2

Why Is It Better to Be Married to a Successful Broadway Producer Than a Plumber?

- | | | |
|----------------------|----------------------|------------------------|
| E. $(a - 1)(a + 7)$ | F. $(k + 2)(k - 9)$ | B. $(x - 2y)(x + 10y)$ |
| A. $(a - 2)(a + 5)$ | U. $(k - 2)(k + 15)$ | L. $(x + 3y)(x - 11y)$ |
| L. $(a + 1)(a - 6)$ | A. $(k + 3)(k - 8)$ | H. $(x - 5y)(x + 16y)$ |
| U. $(a + 3)(a - 5)$ | E. $(k - 1)(k + 35)$ | A. $(x + 3y)(x - 12y)$ |
| S. $(a - 2)(a + 11)$ | S. $(k + 4)(k - 7)$ | S. $(x - 4y)(x + 9y)$ |
| O. $(a - 2)(a + 6)$ | L. $(k - 8)(k + 9)$ | U. $(x + 2y)(x - 18y)$ |
| H. $(a + 2)(a - 25)$ | T. $(k + 5)(k - 13)$ | F. $(x + 6y)(x - 6y)$ |

A FULL HOUSE BEATS A FLUSH

13.4