

**A Precalculus Crossmath
Puzzle by Larry Riddle
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DIRECTIONS

- A numeric answer is entered one digit per box. Ignore the decimal point when entering the digits. For a negative digit, enter the minus sign with the digit in its own box.
- If the answer is a polynomial then each coefficient is entered in a box starting with the term of highest degree.
- The number of significant places to round to is determined by the number of boxes available for the answer.
- For (x, y) enter x then y .
- For a line, enter m then b .
- For two numeric answers enter the smallest number first.
- For a fraction, enter numerator then denominator.

ACROSS

1. The base 10 equivalent of 1110101 in base 2.

4. The prime factors of 35

6. $(2x - 3)^2 + 8x$

9. $\log 121$

10. The numerator of $\frac{7}{5} + \frac{3}{4}$

11. Quotient and remainder of $\frac{5x^2 - 3x - 6}{x + 1}$

12. The antilog of $(\log 3a + \log 4a - 2 \log a)$

13. $\frac{5}{12} \div \frac{7}{10}$ in reduced form

15. The positive root of $x^2 + 4x - 6 = 0$

16. $\frac{4956x^2}{12x^2}$ when $x = \sqrt{\pi}$

18. The ratio of the circumference of a circle to the diameter

20. The value of c if $y = c$ is the horizontal asymptote of $y = \frac{3x - 1}{x + 2}$

21. The only two digit prime with each digit the same

22. The value of c if $x = c$ is a vertical asymptote of the graph in 20 across

23. $\cos \theta \times 10$ if θ is $5\pi/9$ radians

25. The maximum number of roots of a cubic polynomial

1	2	3		4	5		6	7	8
9				10			11		
12			13			14		15	
	16	17			18		19		
20		21							22
23	24			25		26		27	
	28		29			30			
31			32		33			34	35
36		37		38			39		
40				41			42		

26. Two numbers that differ by 2 and whose product is 195

28. $(6x^3 + 2x^2 + 3x + 1) - (2x^2 + x - 1)$

30. $\tan(-31^\circ) \times 10^3$

31. The exponent of a in $a^6(a^5)^2 / a^4$

32. Quotient and remainder of $\frac{5x^3 + x + 13}{x^2 - x + 1}$

34. The line through (0,5) that is perpendicular to $y = -\frac{1}{3}x + 2$

36. The digits of this number (which is larger than 500) multiply to 21

38. Sum of the divisors of 42

39. Numerator of $\frac{6x}{x-1} - \frac{1}{x} - 3$ when all terms are combined

40. The maximum area of a rectangle with perimeter 80

41. $\log_2 4096$

42. The volume of a box of dimension $6 \times 8 \times 17\frac{3}{4}$

DOWN

1. The square of 11

2. The 10th power of 2

3. $f(3)$ if $f(x) = 2x^3 + 5x^2 - 4x - 9$

4. The vertex of $y = x^2 - 10x + 70$

5. $5^{2.6695}$

6. Roots of $x^2 - 9x + 20 = 0$

7. $(1 - 2x)(x + 2)(1 + 2x)$

8. The length of the hypotenuse of a right triangle of sides 6 and 7

13. $\frac{x + 3x^2}{x} + 2x^2$

14. $f(g(x))$ when $x = 2$ if $f(x) = 3x + 6$ and $g(x) = x^2 + 1$

17. The diameter of a circle with area 102 sq. units

19. The area of an equilateral triangle of side length 10

20. A factor of $3x^2 - 4x + 1$

22. The slope of the line through the points (1,3) and (6,1)

24. The height of a building with angle of elevation of 60° at a distance 44 feet from the base

25. 478 ft/sec when expressed in miles per hour

26. A monic polynomial with roots 2 and 4

27. The sum of the first 150 positive integers

29. The intersection of the lines $3y - 2x = 11$ and $3x + 4y = 26$

31. The volume of a right circular cone of radius 2 and height 4.15

33. Largest solution to $x - 4\sqrt{x} = 0.1$

35. When cubed, the sum of the digits of this number gives the original number

37. The perimeter of the triangle in 19 down

39. The area of a $\frac{1}{2}$ inch wide border that surrounds a 17×20 inch picture

Answers to Crossmath Puzzle

1 1	2 1	3 7		4 5	5 7		6 4	7 -4	8 9
9 2	0	8		10 4	3		11 5	-8	2
12 1	2		13 2	5	4	14 2		15 1	2
	16 4	17 1	3		18 3	1	19 4	2	
20 3		21 1	1		5		3		22 -2
23 -1	24 7	4		25 3		26 1	3	27 1	5
	28 6	0	29 2	2		30 -6	0	1	
31 1	2		32 5	5	33 1	8		34 3	35 5
36 7	1	37 3		38 9	6		39 3	2	1
40 4	0	0		41 1	2		42 8	5	2