

$$\sqrt{(a-1)^2 + (b-1)^2} + \sqrt{(a-1)^2 + b^2} + \sqrt{a^2 + (b-1)^2} + \sqrt{a^2 + b^2}$$

where a, b are arbitrary real numbers.

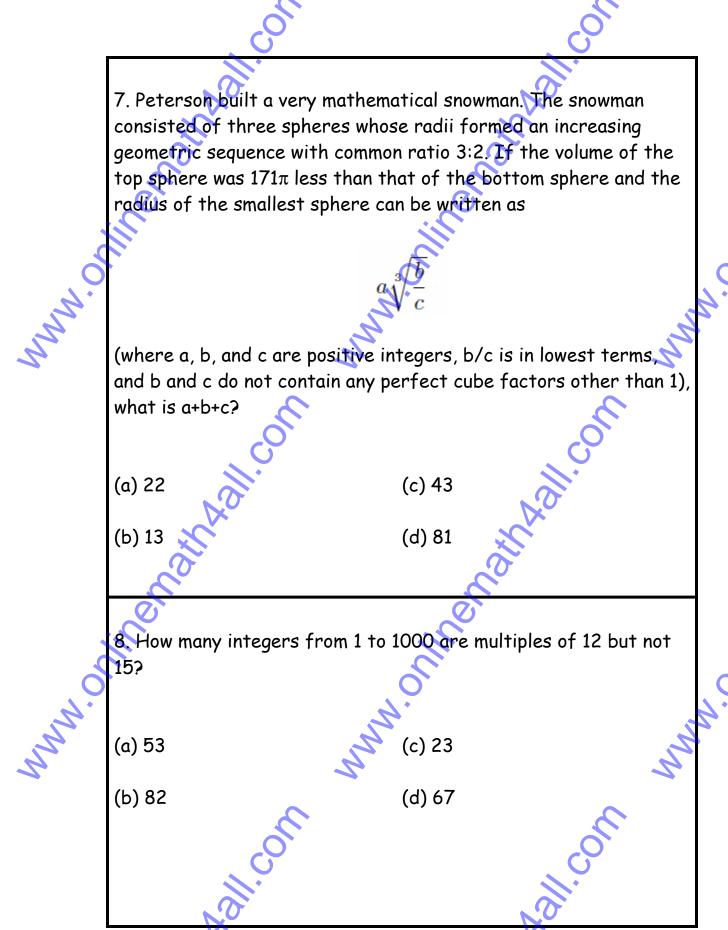
2. The numbers 1-4 are written on a board. At any time, we may pick three numbers a, b, and c on the board and replace them with (a+b)/2, (b+c)/2 and (c+a)/2. If M and M are the greatest and smallest sums of the four numbers that can be attained after doing the operation twice, respectively, then find $M \times M$

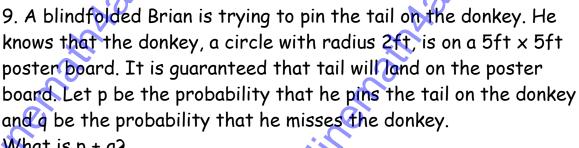
3. Evaluate the following:

$$1 + \frac{2}{1 + \frac{2}{1 + \frac{2}{1 + \dots}}}$$

(b)
$$1/3$$

	com	COLL	
)A.	has 2/3 chance of winning a mat winning a match (no ties are allo James will win in three or fewer matches?	ting in a basketball duel. McCain tch and Jordan has 1/3 chance of tweed). What is the probability that matches if they play five	
MM O.	(b) 432/443	(c) 332/343 (d) 532/543	7.
	5. How many factors does 84 ho	(c) 24	
	(a) 25	(c) 24	
	(b) 12	(d) 18	2)
		ritten in binary (base 2), is made . +β).	Wolling Man
MM O.	(a) 69	(c) 62	2
		(d) 64	
	(b) 68	(d) 64	





What is p + q?

(a) 1

(b) 2

10. Let f(n) be the remainder when n^3 is divided by 7. What is f(f(f(3)))?

(a) 2

(c) 6

(d) 5

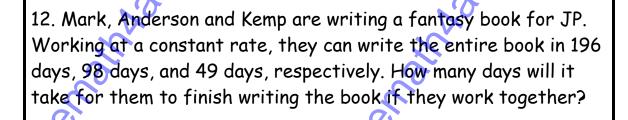
11. At which point(s) do the parabola $y = x^2 - 2x + 1$ and the line 2x+ y = 1 intersect?

(a)(-1,0)

(c)(0,1)

(b) (1,0)

(d)(0,-1)



(a) 20

(c) 38

(b) 28

(d) 40

13. If a circle intersects the x-axis at points (6, 0), (8, 0) and goes through the point (3, 2), find the radius of the circle.

(a) √337

(c) √337 / 2

(b) √33**7** ¼ 4

(d) √337 / **3**

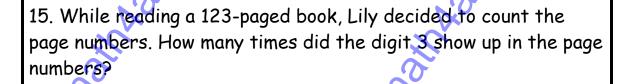
14. Consider the unit sphere (a sphere with radius 1) centered at the origin. Find the shortest possible distance between a point on the unit sphere and the point (3, 4, 5).

(a) 5√2-1

(c) 5√2+1

(b) 4√2-1

(d) 4√2+1



(a) 20

(c) 22

(b) 21

(d) 23

16. If $f(x) = x^3 + ax^2 + bx + c$, f(1) = 34, and f(4) = 100, find f(3) = 100.

(a) 18

(c) 20

(b) 19

(d) 21

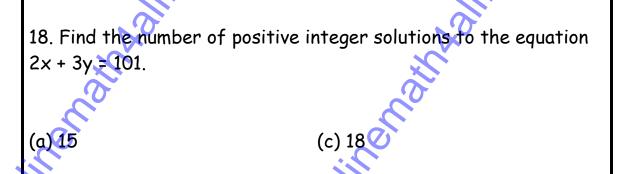
17. In Zhuland, quarters have radius 5 cm and dimes have radius 1 cm. If I drop a dime onto a quarter such that its center lies in the interior of the quarter (with every point in the interior having equal probability of being chosen), find the probability that the dime lies entirely within the quarter.

(a) 9/25

(c) 11/25

(b) 16/25

(d) 13/25

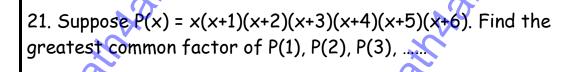


19. When evaluated, the difference $2^{10}-2^9$ can be expressed in the form a^b , where a and bare integers and a is a prime number If i is the square root of -1, then find the value of

$$i^{-b^a}$$

$$i^{-b^a}$$
(a) -i (c) 1
(b) -1 (d) i

20. Find the integer x that satisfies $x^3-3x^2+3x+124=0$.



(a) 5038

(c) 5040

(b) 5039

(d) 5041

22. If the perimeter of a rectangle is 28 and the length of its diagonal is 10, find its area.

(a) 64

(c) 81

(b) 72

(d) 48

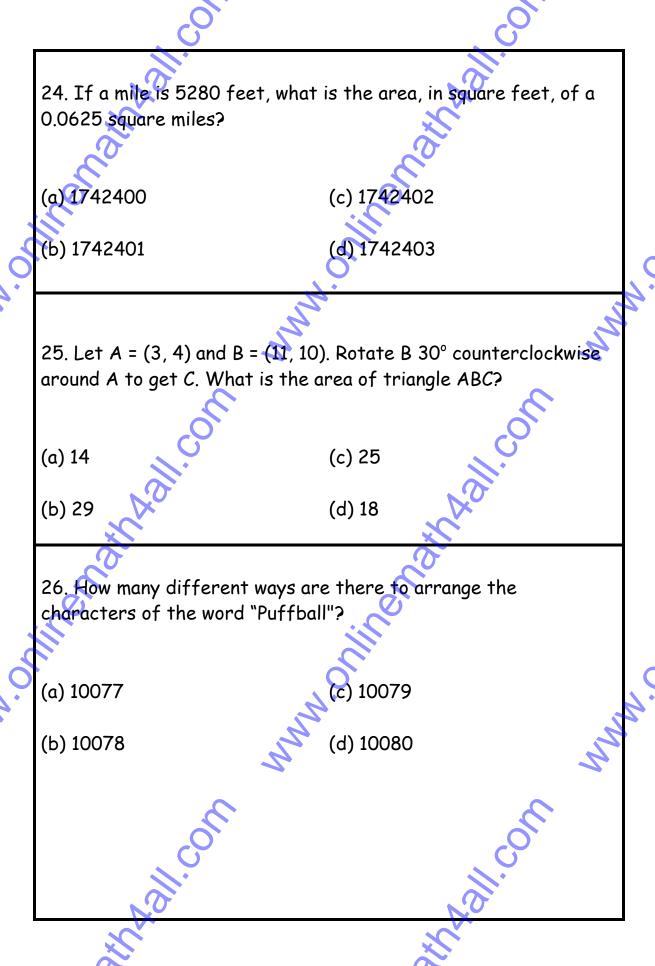
23. Mr. Bush has two red balls, three blue balls, and four white balls. All balls of the same color are indistinguishable. How many ways are there of arranging the nine balls in a circle?

(a) 190

(c) 160

(b) 140

(d) 170



27. Johnson likes to shop and is about to buy a pair of pants when he realizes that he has 12 dollars short of the price. He asks her friend Janet, who started out with 25 times the amount of money he did, to lend her 12 dollars. Jack, who has not spent any money, agrees and is left with 20 dollars. How much money did the two have in the beginning of their shopping trip combined?

(a) 200

(c) 160

(b) 180

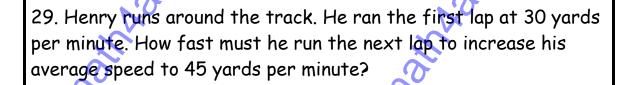
(d) 140

28. What is the equation of the line formed when the line x + 2y =5 is reflected across the x-axis and then the y-axis? Write your answer in the form Ax + By = C, where A, B, and C are integers and A is positive.

(c)
$$x+2y+5=0$$

Signal Cold

(d)
$$x-2y+5=0$$



30. Suppose $A^2 + B^2 + C^2 = 4$ and AB + BC + CA = 3. Find the value of $(A + B + C)^2$.

31. If one side of a triangle is 50 cm long and the another side is 60 cm long, how many possible integer side lengths are there for the last side?

(a)
$$77$$

	32. Richard randomly picks two numbers (not necessarily distinct) out of the set $\{\pi, 2, \sqrt{2}, 3.5\}$. Let p be the probability that the sum of the two numbers is an integer, and let q be the probability that the product of the two numbers is an integer. Find p + q.	
WW.	(a) 3/8 (c) 2/7 (b) 1/6 (d) 3/5	4. office
	33. Mr. John got an iPod touch and wanted to measure its battery life. After five runs, he recorded the following times in hours: 22.7, 19.125, 14.3, 23, and 20.875. What was the average battery life in hours?	
	(a) 15 (c) 20 (d) 22	
MAN O.	34. There are four pandas being sent off to four zoos, with each panda going to a random zoo. What is the probability that one zoo gets all four pandas?	A. Chinon
	(a) 2/65 (c) 1/64 (d) 4/65	



(a) 578/5500

(c) 678/5500

(b) 579/5500

(d) 679/5500

36. Let the number n be your answer for this problem. What is 6 - (9/n)?

(a) 3

(c) 2

(b) 4

(d) 1

37. When the elements in the set given below

$$\left\{\frac{\pi}{2}, \frac{\pi}{2} \cdot \frac{\pi}{3}, \left(\frac{\pi}{3}\right)^2 \right\} \frac{\pi}{4}\right\}$$

are simplified to lowest terms, what is the maximum value?

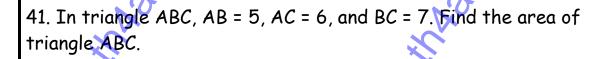
(a) $\pi^2/5$

(c) $\pi^2/7$

(b) $\pi^2/6$

(d) $\pi^2/8$

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	38. A six-sided die is rolled four times. What is the probability that two sixes are rolled consecutively?	
	(a) 1/27 (c) 3/27	
THU .O.	(b) 2/27 (d) 4/27	M.C.
n	39. Let circle A have radius R, where R is a positive integer between 1 and 10 inclusive. We also know that R has four distinct positive integer divisors. Find the sum of all possible areas of A.	
	(a) 120π (c) 140π	
	(b) 180π (d) 200π	
	40. Alex, Brian, Charles, David, and Ed competed in a race, in which no one tied. Given that Alex beat Charles, Brian beat David and Ed, and Charles beat David, how many different orders of	A. Clinor
),	finishers could there have been?	dill
MM	(a) 5 (c) 9	7.
	(b) 12 (d) 8	
	ath all. of a strain of the st	
	and the second s	



(a) 6\d

(c) 12\(\frac{1}{6}\)

(b) 14√6

(d) 16√6

42. What is the next term in the following sequence? 1, 2,-2, 4, 4, 6, -8, 8, 16, 10

(a) -62

(c) -32

(b) -25

(d) -44

43. The ratio of a to b is 5: 1 and the ratio of b to c is 3/2. What is a : c?

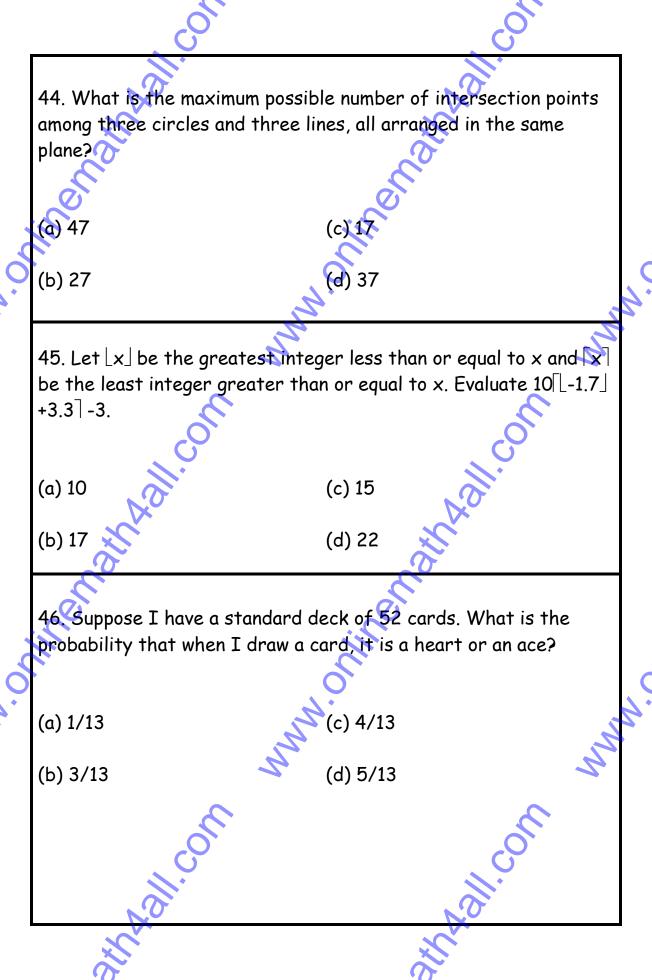
(a) 9/2

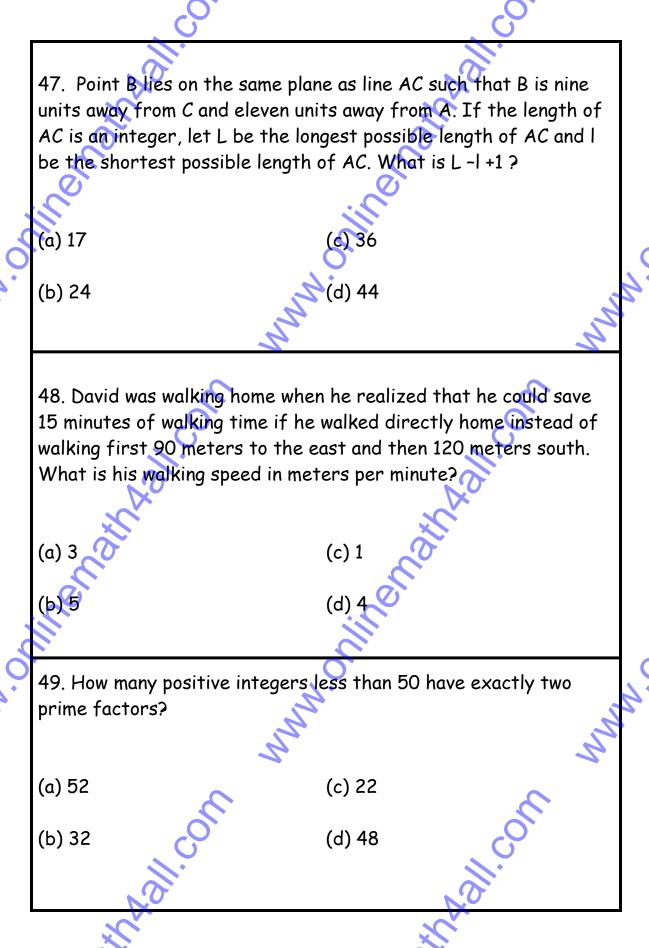
(c) 29/2

(b) 27/2

Agli.on

(d) 15/2





50. Mr. Henry buys a car for \$1500 and sells it for \$1650. Find the profit percentage.

(a) 14%

(c) 15% My Ocilians (a) 14. (b) 10% (d) 13% Man Single Coll. www.cimenaithall.com Who chings of the control of the con

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	Answers	Molling			XX ASI		
	1. a	2. c	3. d 9. a 15. d	4. a	5. b	6. b	Modified States
MANAMA	7. c	8. d	9. a	10. c	11. c	12. b	
hun	13. b	14. a	15. d	16. c	17. b	18. b	
	19. a	20. c	21. c	22. d	23. b	24. a	
	25. c	26. d	27. c	28. c	29. 0	30. d	
Mul O.	31. d	32. a	33. c	34. c	35. d 41. a 47. a	36. a	
	37 . b	38. b	39. d	40.c	41. a	42. c	OCITA
MAN	43. d	44. b	45. b	46. c	47. a	48. d	
	49. 0	90. b					
		1911.0			Lol		
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