

# Math Test with pictures

Jan 31, 2009

Name: \_\_\_\_\_

1. All triangles are scalene. ☐ True ☐ False

2. Check each number which is a multiple of three.

☐ 3 ☐ 5 ☐ 7 ☐ 9

3. Check each number which is negative.

☐ 81 ☐ 20 ☐ 26 ☐ 32

☐ 35 ☐ 39 ☐ -74 ☐ 48

☐ 80 ☐ -35 ☐ 13 ☐ -60

4. Compute:  $\sum_{i=1}^{25} i$ . Answer:

5. "A three sided figure." defines what geometrical term? Answer:

6. What is the English name for a large african or indian mammal with floppy ears and and a long nasal trunk?

7. Compute the derivative of  $f(x) = x^3 + 4x - 2$ . Answer:

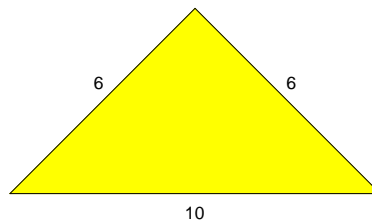
8. Compute the partial derivative of  $\frac{\partial}{\partial y} f(x, y)$  if  $f(x, y) = x^3 + 4x - 2 \sin(yx)$ . Answer:

9. Compute the definite integral:  $\int_1^3 f(x) dx$  if  $f(x) = x^3 + 4x - 2$ . Answer:

$f(x)$	$f(2)$	$\int_0^1 f(x) dx$	$\frac{d}{dx} f(x)$
$\sin(x)$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$x^2 + 3$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$\exp(x)$	<input type="text"/>	<input type="text"/>	<input type="text"/>

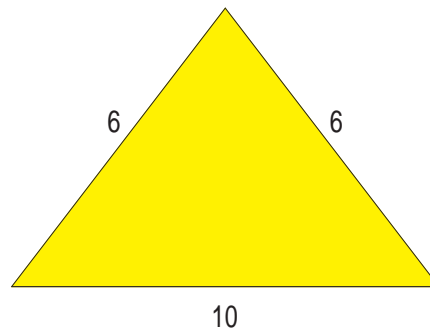
10. Complete the table:

11. Classify the triangle shown below.



☐ isosceles    ☐ right    ☐ equiangular

12. Classify the triangle shown below.



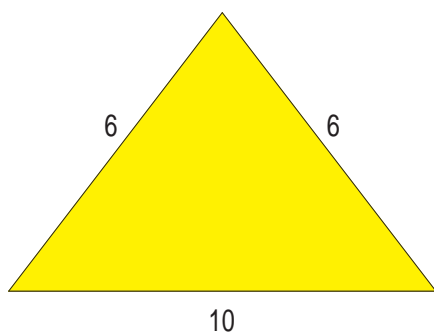
☐ isosceles    ☐ equiangular    ☐ right

13. Estimate the age of the person in the picture below.

☐ 40-49    ☐ 50-59    ☐ 60-69    ☐ 70-79    ☐ 80-89    ☐ 90-99

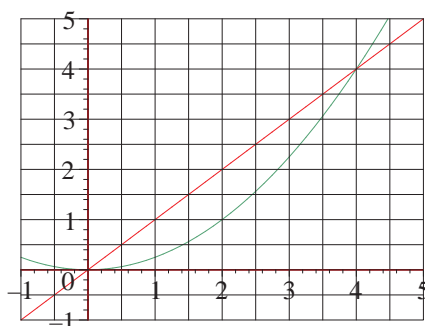


14. Find the area of the isosceles triangle shown below. Answer:

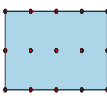


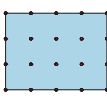
15. Find the area between the graphs of  $y = \frac{1}{4}x^2$  and  $y = x$ , for  $0 \leq x \leq 4$  shown below.

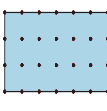
Answer:



16. For each rectangle below, count the number  $B$  of boundary nails, the number  $I$  of interior nails, and also compute the area of the rectangle, assuming that adjacent horizontal or vertical pairs of nails are 1 unit apart.

$$B = \boxed{\phantom{00}} \quad I = \boxed{\phantom{00}} \quad \text{Area} = \boxed{\phantom{00}}$$


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17. Compute:  $\sum_{i=1}^{50} i$ . Answer:

18. Compute:  $\sum_{i=1}^{25} 3i + 2$ . Answer:

19. Compute:  $\sum_{i=1}^{25} ri + s$ . Answer:

20. Compute:  $\sum_{i=1}^{30} 2i + 20$ . Answer:

21. Which of the numbers 2281883 and 2200229 is larger? Answer:

22. What is the value of the cell in row 1 and column,3 of  $\begin{pmatrix} 78 & -2 & 33 & -58 & 98 \\ -8 & -69 & -17 & 75 & 5 \\ -90 & 17 & 58 & -31 & -23 \\ -81 & -87 & -21 & -30 & 19 \\ -43 & 37 & 15 & -50 & -93 \end{pmatrix}$ ?

23. Evaluate the function  $f(x, y) = 3 \ln(x^2 + 8y^2 + 8)$  at  $(x, y) = (1, \frac{1}{2})$

Consider the function  $f(1, y)$  of  $y$ : Decide if it is increasing, decreasing or neither over its natural domain.  increasing  neither  decreasing

24. Solve for  $\theta$ ,  $\theta$  in  $[0, 2\pi)$ :  $2\sin(\theta)^2 - \sin(\theta) = 3$   
☐  $\frac{3}{2}\pi$    ☐ 0   ☐  $\frac{1}{3}\pi$    ☐  $\frac{1}{2}\pi$   
☐  $\pi$    ☐  $\frac{5}{4}\pi$    ☐ All reals   ☐ No solution
25. Solve for  $\theta$ ,  $\theta$  in  $[0, 2\pi)$ :  $2\sin(\theta)^2 - \sin(\theta) = 3$   
☐  $\frac{1}{2}\pi$    ☐ No solution   ☐  $\frac{5}{4}\pi$    ☐  $\pi$   
☐  $\frac{1}{3}\pi$    ☐  $\frac{3}{2}\pi$    ☐ 0   ☐ All reals
26. Bill can mow a yard in 3 hours. Jim can mow the same yard in 5 hours. How many hours does it take Bill and Jim to mow the yard together, assuming they do not interfere with each other? Select the most nearly correct answer.   ☐ 1.875   ☐ 2.125   ☐ 4   ☐ None of the others
27. Bill can mow a yard in 3 hours. Jim can mow the same yard in 5 hours. How many hours does it take Bill and Jim to mow the yard together, assuming they do not interfere with each other? Select the most nearly correct answer.  
☐ 2.125   ☐ 1.875   ☐ 4   ☐ None of the others
28. Classify the indeterminacy type of the following limits:  
i)  $\lim_{x \rightarrow \infty} \frac{-4x + 11}{-4 + 11x}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$   
ii)  $\lim_{x \rightarrow \infty} \frac{x^2 - 4}{x - 2}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$
29. Classify the indeterminacy type of the following limits:  
i)  $\lim_{x \rightarrow \infty} \frac{-1x + 3}{-1 + 3x}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$    ☐  $\infty/\infty$   
ii)  $\lim_{x \rightarrow \infty} \frac{x^2 - 4}{x - 2}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$    ☐  $\infty/\infty$
30. Classify the indeterminacy type of the following limits:  
i)  $\lim_{x \rightarrow \infty} \frac{-5x + 7}{-5 + 7x}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$   
ii)  $\lim_{x \rightarrow \infty} \frac{x^2 - 4}{x - 2}$    ☐  $\frac{\infty}{-\infty}$    ☐ 0/0   ☐  $0^0$    ☐  $\infty^\infty$

31. Given  $A = \{1, 2, 3\}$ ,  $B = \{5, 14, 17\}$ .

a) How many members in  $A \cup B$ ? Answer:

b) How many members in  $A \cap B$ ? Answer:

c) How many members in  $A \times B$ ? Answer:

32. Given  $A = \{4, 5, 7, 11\}$ ,  $B = \{5, 14, 17\}$ .

a) Is  $A \subset B$ ? Answer: ☐ *yes* ☐ *no*

b) Is  $3 \in A$ ? Answer: ☐ *false* ☐ *true*

c) How many members in  $(A \times B) \cup (B \times A)$ ? Answer:

33. From the given information about the arithmetic sequence  $x_1, x_2, x_3 \cdots x_n \cdots$ , find its  $n^{th}$  term.

a)  $x_1 = 12$ ,  $x_2 = 16$ .  $x_n =$

b)  $x_4 = 12$ ,  $x_6 = 16$ .  $x_n =$

c) For some fixed positive integer  $A$ ,  $x_A = 12$ ,  $x_{A+1} = 16$ .  $x_n =$

34. Calculate:  $(40 \div 35) + (6 \div 40) =$

35. Calculate:  $(30 \cdot 13) + (8 \div x) =$

36. a) Calculate:  $\lim_{x \rightarrow 40} \frac{1}{34} x^2 + 6$

b) Calculate:  $\frac{\partial^3}{\partial x^2 \partial y} (x^3 \sin(yz) + y^4 x + \ln(z))$  Answer:

## 1 Answer Key for addpicandragitv1

1.  $\diamond 2$
2.  $\diamond ;1;;;4$
3.  $\diamond ;;;;;;7;;;10;;12$
4.  $\diamond 325$
5.  $\diamond \text{triangle, Triangle}$
6.  $\diamond \text{Elephant, elephant}$
7.  $\diamond 3x^2 + 4$
8.  $\diamond -2 \cos(yx) x$
9.  $\diamond 32$
10.  $\diamond \sin(2)$   
 $\diamond 1 - \cos(1)$   
 $\diamond \cos(x)$   
 $\diamond 7$   
 $\diamond \frac{10}{3}$   
 $\diamond 2x$   
 $\diamond \exp(2)$   
 $\diamond -1 + \exp(1)$   
 $\diamond \exp(x)$
11.  $\diamond 1$
12.  $\diamond 1$
13.  $\diamond 3$
14.  $\diamond 16.583$
15.  $\diamond \frac{8}{3}$
16.  $\diamond 12$   
 $\diamond 3$   
 $\diamond 8$   
 $\diamond 14$   
 $\diamond 6$   
 $\diamond 12$   
 $\diamond 18$   
 $\diamond 10$   
 $\diamond 18$
17.  $\diamond 1275$
18.  $\diamond 1025$
19.  $\diamond 25s + 325r$
20.  $\diamond 1530$
21.  $\diamond 2281883$
22.  $\diamond 33$
23.  $\diamond 3 \ln(11)$   
 $\diamond 2$

- 24.  $\diamond 1$
- 25.  $\diamond 6$
- 26.  $\diamond 1$
- 27.  $\diamond 2$
- 28.  $\diamond 1$   
 $\diamond 2$
- 29.  $\diamond 1$   
 $\diamond 2$
- 30.  $\diamond 1$   
 $\diamond 2$
- 31.  $\diamond 6$   
 $\diamond 0$   
 $\diamond 9$
- 32.  $\diamond 1$   
 $\diamond 1$   
 $\diamond 24$
- 33.  $\diamond 8 + 4n$   
 $\diamond 4 + 2n$   
 $\diamond 12 - 4A + 4n$
- 34.  $\diamond \frac{181}{140}$
- 35.  $\diamond \frac{390x+8}{x}$
- 36.  $\diamond \frac{902}{17}$   
 $\diamond 6x \cos(yz)z$