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Quiz 3A, MTH 2010 - No Calculators

Dr. Graham-Squire, Spring 2015

Name: Key

⇒ 15 minutes.

1. (2 points) Below is an example multiplication using the partial products algorithm. Use either the distributive property or the array given below to explain where the parts of the calculation come from.

	5	7		
×	2	4		
<hr/>				
	2	8		
	2	0	0	
	1	4	0	
+	1	0	0	0
<hr/>				
	1	3	6	8

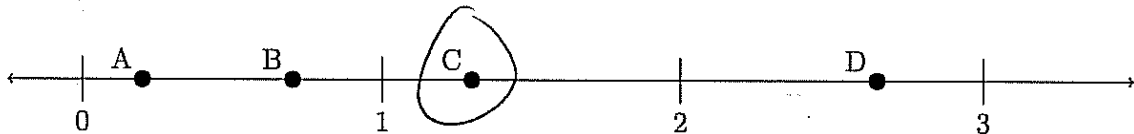
20	20 × 50 = 1000
+	
4	50 × 4 = 200

	20 × 7 = 140
	4 × 7 = 28

The different sections of the array correspond to the parts of the algorithm.

or do $57 \times 24 = (50+7) \times (20+4) = 50 \times 20 + 50 \times 4 + 7 \times 20 + 7 \times 4 = 1000 + 200 + 140 + 28$

2. (3 points) Which of the following points is closest to $\frac{183}{114} \times \frac{63}{79}$? Show your work!



(a) A

(b) B

(c) C

(d) D

$$\frac{183}{114} \approx \frac{180}{110} = \frac{18}{11}$$

$$\frac{63}{79} \approx \frac{60}{80} = \frac{6}{8} = \frac{3}{4}$$

$$\frac{18}{11} \cdot \frac{3}{4} = \frac{54}{44}$$

greater than 1, less than 2

3. (2 points) Use properties of arithmetic to show/explain how you could make the following problem easy to do *mentally*. You can use words and/or mathematical equations to explain your work (full credit will *not* be given if you simply use a multiplication algorithm to find the answer):

$$24 \times 25$$

$$\begin{aligned} & 24 \times 25 \\ &= 6 \times 4 \times 5 \times 5 \\ &= (6 \times 5) \times (4 \times 5) \\ &= 30 \times 20 \\ &= 600 \end{aligned}$$

$$\begin{aligned} & \text{or } 24 \times 25 \\ &= (20 + 4) \times 25 \\ &= 20 \times 25 + 4 \times 25 \\ &= 500 + 100 \\ &= 600 \end{aligned}$$

4. (3 points) Which of the following is the best approximation for the value of

$$\frac{(1.8 \times 10^3) \times (3.4 \times 10^8)}{2.1 \times 10^4}$$

Show your work!

(A) Thirty million

(B) Three million

(C) Three hundred thousand

(D) Thirty thousand

$$1.8 \approx 2$$

$$3.4 \approx 3$$

$$2.1 \approx 2$$

$$\Rightarrow \frac{2 \times 10^3 \times 3 \times 10^8}{2 \times 10^4}$$

$$= \frac{6 \times 10^{11}}{2 \times 10^4}$$

$$= \frac{6}{2} \times \frac{10^{11}}{10^4}$$

$$= 3 \times 10^7 = 30,000,000$$

= Thirty million