Math 105 Spring 2010
DEPARTMENT FINAL

1) 70,146
seventy thousand,
one hundred forty-six (B)

2) Eighty-two thousand
82,000 (A)

3) $\begin{array}{r} {}^{5}\not{6}{}^{14}\not{5}{}^{13}3 \\ -\ 55 \\ \hline 598 \end{array}$ (C)

$\begin{array}{r} {}^{1\,1}598 \\ +\ 55 \\ \hline 653 \end{array}$ ✓

4) $\begin{array}{r} 890 \\ 44\overline{)39160} \\ -\ 352 \\ \hline 396 \\ -\ 396 \\ \hline 0 \\ -\ 0 \\ \hline 0 \end{array}$

$\begin{array}{r} 44 \\ \times\ 8 \\ \hline 352 \end{array}$ $\begin{array}{r} 44 \\ \times\ 9 \\ \hline 396 \end{array}$ (C)

5) $1391 \times 72$

$\begin{array}{r} 1391 \\ \times\ 72 \\ \hline {}^{1}2782 \\ 9737 \\ \hline 100152 \end{array}$ (B)

6) $6\left[3^2+7(3+2)\right]$

$= 6\left[3^2+7\cdot 5\right]$

$= 6\left[9+7\cdot 5\right]$

$= 6\left[9+35\right]$

$= 6 \cdot 44$

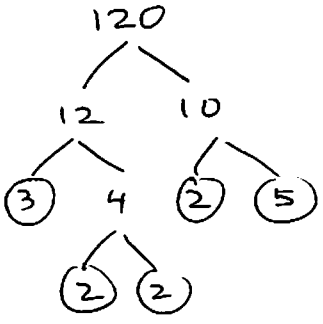
$= 264$ (C)

7) List all the factor of 42

$1\times 42$
$2\times 21$
$3\times 14$
$6\times 7$

$\Rightarrow$ 1, 2, 3, 6, 7, 14, 21, 42

8) Prime-Factorize 120




$120 = 2^3 \cdot 3 \cdot 5$

Other method

$\begin{array}{r|l} 2 & 120 \\ 2 & 60 \\ 2 & 30 \\ 2 & 15 \\ 3 & 5 \end{array}$

9) Is 1191 a prime or composite?

Easy method: Try divisibility test.

sum of the digits $= 1+1+9+1 = 12$ ← multiple of 3

So, 1191 is a multiple of 3

Therefore, 1191 has more than 2 factors: 1, 1191, 3, ... (A)

1199 is a composite number

NOTE: 1 is the only natural number that is not prime nor composite

Hard/Advance: Eratosthenes method

$900 = 30^2 < 1191 < 35^2 = 1225$

So, try to divide 1191 by prime numbers less than 35, starting from smallest prime number.

10) Find LCM(60, 80, 70)

$60 = 2^2 \cdot 3 \cdot 5$

$70 = 2 \quad 5 \quad 7$

$80 = 2^4 \quad 5$

LCM $= 2^4 \cdot 3 \cdot 5 \cdot 7$ ← choose highest exponent from each

$= 16 \cdot 3 \cdot 5 \cdot 7$

$= 48 \cdot 5 \cdot 7$

$= 240 \cdot 7$

$= 1680$

(D)

Other method:

LCM(60, 80, 70)

$= \text{LCM}(240, 70)$

$= 1680$

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11) $\frac{10}{7} = \frac{30}{21} \rightarrow \frac{30}{21}$ (×3 on each side)

Other method: Proportion Method

$\frac{10}{7} = \frac{n}{21}$

CM $10 \times 21 = 7 \times n$

$210 = 7 \times n$

$\frac{210}{7} = n$

$30 = n$

$\frac{30}{21}$

(C)

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12) $\frac{1}{2} + \frac{3}{8}$

$= \frac{4}{8} + \frac{3}{8}$

$= \frac{7}{8}$

(D)

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13) $\frac{28}{13} - \frac{5}{13}$

$= \frac{23}{13}$

$= 1\frac{10}{13}$

(D)

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14) Total parts = 16

shaded parts = 9

$\rightarrow \frac{9}{16}$

(A)

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15)

$9\frac{6}{7}$

$10\frac{3}{7}$

$+ \quad 15\frac{6}{7}$

$34\frac{15}{7}$

$= 34 + 2\frac{1}{7}$

$= 36\frac{1}{7}$

(D)

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16) $\frac{25}{55} = \frac{5}{11}$

$\frac{20}{44} = \frac{5}{11}$

} both reduce to same fraction

(A)

So, $\frac{25}{55}$ and $\frac{20}{44}$ are equivalent

Other method: PROPORTION method

$\frac{25}{55} \stackrel{?}{=} \frac{20}{44}$ ← check if it is a true proportion

$25 \times 44 \stackrel{?}{=} 20 \times 55$

$1100 = 1100$ ✓

So, $\frac{25}{55} = \frac{20}{44}$

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17) 1.799

one
and
seven hundred ninety-nine
thousandths

(C)

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18) 0.328

$= \frac{328}{1000}$ ← reduce

$= \frac{82}{250}$

$= \frac{41}{125}$

(C)

19) $\begin{array}{r} {\scriptstyle 2\,1\,1} \\ 282.83 \\ 80.30 \\ 64.10 \\ +\ 23.50 \\ \hline 450.73 \end{array}$ (B)

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20) Paid with $2 \times \$20 = \$40$

So, change $= \$40 - \$21.50$

$\begin{array}{r} {\scriptstyle 3\ 9\ 10} \\ \cancel{40}.\cancel{0}0 \\ 21.50 \\ \hline 18.50 \end{array}$

$\$18.50$ (C)

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21) $18 \div 0.06$

$= 1800 \div 6$ (A)

$= 300$

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22) $80\% = \frac{80}{100} = \frac{8}{10} = \frac{4}{5}$ (A)

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23) $\frac{3}{16} = \frac{3}{16} \times 100\%$

$= \frac{300}{16}\%$

$= 18\frac{12}{16}\%$

$= 18\frac{3}{4}\%$ (D)

$\begin{array}{r} 18 \\ 16\overline{)300} \\ -\ 16 \\ \hline 140 \\ 128 \\ \hline 12 \end{array}$

IF we do cross-cancelling first

$\frac{3}{16} = \frac{3}{\cancel{16}_{4}} \times \frac{\overset{25}{\cancel{100}}}{1}\% = \frac{75}{4}\% = 18\frac{3}{4}\%$

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24) $823\% = \frac{823}{100} = 8.23$ (C)

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25) 40% of students are female

$40\% \times 255 = n$

$0.4 \times 255 = n$

$102 = n$

$\begin{array}{r} 255 \\ \times\ 0.4 \\ \hline 102.0 \end{array}$