

Math 303

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$$\#1. (a) 0.023 = 0 \cdot \frac{1}{10} + 2 \cdot \frac{1}{100} + 3 \cdot \frac{1}{1000} = 0 \cdot 10^{-1} + 2 \cdot 10^{-2} + 3 \cdot 10^{-3}$$

$$(b) 206.06 = 2 \cdot 100 + 0 \cdot 10 + 6 \cdot 1 + 0 \cdot \frac{1}{10} + 6 \cdot \frac{1}{100} \\ = 2 \cdot 10^2 + 0 \cdot 10^1 + 6 \cdot 10^0 + 0 \cdot 10^{-1} + 6 \cdot 10^{-2}$$

$$(c) 312.0103 = 3 \cdot 100 + 1 \cdot 10 + 2 \cdot 1 + 0 \cdot \frac{1}{10} + 1 \cdot \frac{1}{100} + 0 \cdot \frac{1}{1000} + 3 \cdot \frac{1}{10,000} \\ = 3 \cdot 10^2 + 1 \cdot 10^1 + 2 \cdot 10^0 + 0 \cdot 10^{-1} + 1 \cdot 10^{-2} + 0 \cdot 10^{-3} + 3 \cdot 10^{-4}$$

$$(d) 0.000132 = 1 \cdot \frac{1}{10,000} + 3 \cdot \frac{1}{100,000} + 2 \cdot \frac{1}{1,000,000} \\ = 1 \cdot 10^{-4} + 3 \cdot 10^{-5} + 2 \cdot 10^{-6}$$

#2. (a) 4,356.78

(b) 4000.608

(c) 40,000.03

(d) 0.2004007

#3. (a) 536.0076

(b) 3.008

(c) 0.000436

(d) 5,000,000.2

#4. (a) 0.34 thirty-four hundredths

(b) 20.34 twenty and thirty-four hundredths

(c) 2.034 two and thirty-four hundredths

(d) 0.000034 thirty-four millionths

#5. (a)  $0.436 = \frac{436}{1000} = \frac{109.4}{250.4} = \frac{109}{250}$

(b)  $25.16 = 25 \frac{16}{100} = 25 \frac{4}{25} = \frac{629}{25}$

(c)  $-316.027 = -316 \frac{27}{1000} = -\frac{316,027}{1000}$

(d)  $28.1902 = 28 \frac{1902}{10,000} = 28 \frac{951}{500} = \frac{140,951}{500}$

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#5. (e)  $-4.3 = -4\frac{3}{10} = -\frac{43}{10}$

(f)  $-62.01 = -62\frac{1}{100} = -\frac{6201}{100}$

#7. (a)  $\frac{4}{5} = \frac{8}{10} = 0.8$

(b)  $\frac{61}{2.5} = \frac{61.5}{(2.5).5} = \frac{305}{10^2} = \frac{305}{100} = 3.05$

(c)  $\frac{3}{6} = \frac{1}{2} = \frac{5}{10} = 0.5$

(d)  $\frac{1}{2^5} = \frac{1.5^5}{2^5.5^5} = \frac{3/25}{10^5} = \frac{3/25}{100,000} = 0.03125$

(e)  $\frac{36}{5^5} = \frac{36.2^5}{5^5.2^5} = \frac{36.32}{10^5} = \frac{1152}{100,000} = 0.01152$

(f)  $\frac{133}{625} = \frac{133}{5^4} = \frac{133.2^4}{5^4.2^4} = \frac{133.16}{10^4} = \frac{2128}{10,000} = 0.2128$

(g)  $\frac{1}{3}$  nonterminating decimal

(h)  $\frac{2}{25} = \frac{8}{100} = 0.08$

(i)  $\frac{1}{13}$  nonterminating decimal

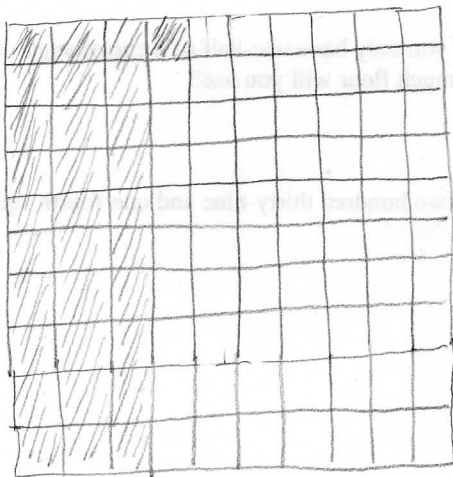
(j)  $\frac{26}{65} = \frac{2.13}{5.13} = \frac{2}{5} = \frac{4}{10} = 0.4$

#11. (a)  $13.492 > 13.49199 > 13.4919 > 13.49183$

(b)  $-1.4053 > -1.45 > -1.453 > -1.493$

#12. (a) 0.014 (b) 365.24

#13.



$0.31 = \frac{31}{100}$

#14. 0.84 since

$0.804 < 0.8399 < 0.84.$

#15. (Answers will vary.)

Sample.

$8.34 < 8.3406 < 8.341$

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#17(a) 0.613 A base ten block represents 1.

The 0.613 is 6 flats, 1 long, and 3 units.

$$\#19. 3.145_{\text{six}} = 3 + 1 \cdot \frac{1}{6} + 4 \cdot \frac{1}{36} + 5 \cdot \frac{1}{216}$$

$$= 3 + \frac{36}{216} + \frac{24}{216} + \frac{5}{216}$$

$$= 3 \frac{65}{216}$$

Rewritten in base ten.

#20. 1st Rhonda 63.54 sec.

2nd Martha 63.59 sec.

3rd Kathy 64.02 sec.

4th Molly 64.46 sec.

5th Emily 64.54 sec.

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NAEP

4 hundredths

$$\frac{4}{100} = 0.04$$

# Worksheet

$$\begin{aligned}\#1. (a) 0.213_{\text{four}} &= 2 \cdot \frac{1}{4} + 1 \cdot \frac{1}{16} + 3 \cdot \frac{1}{64} \\ &= \frac{32}{64} + \frac{4}{64} + \frac{3}{64} = \frac{39}{64}\end{aligned}$$

$$\begin{aligned}(b) 0.403_{\text{five}} &= 4 \cdot \frac{1}{5} + 0 \cdot \frac{1}{25} + 3 \cdot \frac{1}{125} \\ &= \frac{100}{125} + \frac{0}{125} + \frac{3}{125} = \frac{103}{125}\end{aligned}$$

$$\begin{aligned}(d) 0.6281 &= 6 \cdot \frac{1}{10} + 2 \cdot \frac{1}{100} + 8 \cdot \frac{1}{1000} + 1 \cdot \frac{1}{10,000} \\ &= \frac{6000}{10,000} + \frac{200}{10,000} + \frac{80}{10,000} + \frac{1}{10,000} = \frac{6281}{10,000}\end{aligned}$$

$$\begin{aligned}(e) 32.103_{\text{four}} &= 3 \cdot 4 + 2 \cdot 1 + 1 \cdot \frac{1}{4} + 0 \cdot \frac{1}{16} + 3 \cdot \frac{1}{64} \\ &= 12 + 2 + \frac{16}{64} + \frac{0}{64} + \frac{3}{64} = 14 \frac{19}{64}\end{aligned}$$

$$\begin{aligned}(g) 41.253_{\text{six}} &= 4 \cdot 6 + 1 \cdot 1 + 2 \cdot \frac{1}{6} + 5 \cdot \frac{1}{36} + 3 \cdot \frac{1}{216} \\ &= 24 + 1 + \frac{72}{216} + \frac{30}{216} + \frac{3}{216} = 25 \frac{105}{216}\end{aligned}$$

$$(h) 65.6281 = 65 \frac{6281}{10,000} \quad (\text{see part (d)})$$

$$\begin{aligned}\#2. (a) \frac{16}{27} &= \frac{9}{27} + \frac{6}{27} + \frac{1}{27} = \frac{1 \cdot 9}{3 \cdot 9} + \frac{2 \cdot 3}{9 \cdot 3} + \frac{1}{27} \\ &= 1 \cdot \frac{1}{3} + 2 \cdot \frac{1}{9} + 1 \cdot \frac{1}{27} = 0.121_{\text{three}}\end{aligned}$$

$$\begin{aligned}(c) \frac{73}{125} &= \frac{50}{125} + \frac{20}{125} + \frac{3}{125} = \frac{2 \cdot 25}{5 \cdot 25} + \frac{4 \cdot 5}{25 \cdot 5} + \frac{3}{125} \\ &= 2 \cdot \frac{1}{5} + 4 \cdot \frac{1}{25} + 3 \cdot \frac{1}{125} = 0.243_{\text{five}}\end{aligned}$$

$$\begin{aligned}(d) \frac{201}{216} &= \frac{180}{216} + \frac{18}{216} + \frac{3}{216} = \frac{5 \cdot 36}{6 \cdot 36} + \frac{3 \cdot 6}{36 \cdot 6} + \frac{3}{216} \\ &= 5 \cdot \frac{1}{6} + 3 \cdot \frac{1}{36} + 3 \cdot \frac{1}{216} = 0.533\end{aligned}$$