Techniques of Estimation: Exercise Supplement*

Wade Ellis
Denny Burzynski

Abstract

This module is from Fundamentals of Mathematics by Denny Burzynski and Wade Ellis, Jr. This module is an exercise supplement for the chapter "Techniques of Estimation" and contains many exercise problems. Odd problems are accompanied by solutions.

1 Exercise Supplement

1.1 Estimation by Rounding (here[1])

For problems 1-70, estimate each value using the method of rounding. After you have made an estimate, find the exact value. Compare the exact and estimated values. Results may vary.

Exercise 1 *(Solution on p. 8.)*
$286 + 312$

Exercise 2
$419 + 582$

Exercise 3 *(Solution on p. 8.)*
$689 + 511$

Exercise 4
$926 + 1,105$

Exercise 5 *(Solution on p. 8.)*
$1,927 + 3,017$

Exercise 6
$5,026 + 2,814$

Exercise 7 *(Solution on p. 8.)*
$1,408 + 2,352$

Exercise 8
$1,186 + 4,228$

*Version 1.2: Aug 18, 2010 9:00 pm -0500
†http://creativecommons.org/licenses/by/3.0/
[1]"Techniques of Estimation: Estimation by Rounding" <http://cnx.org/content/m35011/latest/>

Exercise 9 *(Solution on p. 8.)*
$5,771 + 246$

Exercise 10
$8,305 + 484$

Exercise 11 *(Solution on p. 8.)*
$3,812 + 2,906$

Exercise 12
$5,293 + 8,007$

Exercise 13 *(Solution on p. 8.)*
$28,481 + 32,856$

Exercise 14
$92,512 + 26,071$

Exercise 15 *(Solution on p. 8.)*
$87,612 + 2,106$

Exercise 16
$42,612 + 4,861$

Exercise 17 *(Solution on p. 8.)*
$212,413 + 609$

Exercise 18
$487,235 + 494$

Exercise 19 *(Solution on p. 8.)*
$2,409 + 1,526$

Exercise 20
$3,704 + 4,704$

Exercise 21 *(Solution on p. 8.)*
$41 \cdot 63$

Exercise 22
$38 \cdot 81$

Exercise 23 *(Solution on p. 8.)*
$18 \cdot 28$

Exercise 24
$52 \cdot 21$

Exercise 25 *(Solution on p. 8.)*
$307 \cdot 489$

Exercise 26
$412 \cdot 807$

Exercise 27 *(Solution on p. 8.)*
$77 \cdot 614$

Exercise 28
$62 \cdot 596$

Exercise 29 *(Solution on p. 8.)*
$27 \cdot 473$

Exercise 30
$92 \cdot 336$

Exercise 31 *(Solution on p. 8.)*
$12 \cdot 814$

Exercise 32
$8 \cdot 2,106$

Exercise 33 *(Solution on p. 8.)*
$192 \cdot 452$

Exercise 34
$374 \cdot 816$

Exercise 35 *(Solution on p. 8.)*
$88 \cdot 4,392$

Exercise 36
$126 \cdot 2,834$

Exercise 37 *(Solution on p. 8.)*
$3,896 \cdot 413$

Exercise 38
$5,794 \cdot 837$

Exercise 39 *(Solution on p. 8.)*
$6,311 \cdot 3,512$

Exercise 40
$7,471 \cdot 5,782$

Exercise 41 *(Solution on p. 8.)*
$180 \div 12$

Exercise 42
$309 \div 16$

Exercise 43 *(Solution on p. 8.)*
$286 \div 22$

Exercise 44
$527 \div 17$

Exercise 45 *(Solution on p. 8.)*
$1,007 \div 19$

Exercise 46
$1,728 \div 36$

Exercise 47 *(Solution on p. 8.)*
$2,703 \div 53$

Exercise 48
$2,562 \div 61$

Exercise 49 *(Solution on p. 8.)*
$1,260 \div 12$

Exercise 50
$3,618 \div 18$

Exercise 51 *(Solution on p. 9.)*
$3,344 \div 76$

Exercise 52
$7,476 \div 356$

Exercise 53 *(Solution on p. 9.)*
$20,984 \div 488$

Exercise 54
$43,776 \div 608$

Exercise 55 *(Solution on p. 9.)*
$7,196 \div 514$

Exercise 56
$51,492 \div 514$

Exercise 57 *(Solution on p. 9.)*
$26,962 \div 442$

Exercise 58
$33,712 \div 112$

Exercise 59 *(Solution on p. 9.)*
$105,152 \div 106$

Exercise 60
$176,978 \div 214$

Exercise 61 *(Solution on p. 9.)*
$48.06 + 23.11$

Exercise 62
$73.73 + 72.9$

Exercise 63 *(Solution on p. 9.)*
$62.91 + 56.4$

Exercise 64
$87.865 + 46.772$

Exercise 65 *(Solution on p. 9.)*
$174.6 + 97.2$

Exercise 66
$(48.3)\,(29.6)$

Exercise 67 *(Solution on p. 9.)*
$(87.11)\,(23.2)$

Exercise 68
$(107.02)\,(48.7)$

Exercise 69 *(Solution on p. 9.)*
$(0.76)\,(5.21)$

Exercise 70
$(1.07)\,(13.89)$

1.2 Estimation by Clustering (here[2])

For problems 71-90, estimate each value using the method of clustering. After you have made an estimate, find the exact value. Compare the exact and estimated values. Results may vary.

Exercise 71 *(Solution on p. 9.)*
$38 + 51 + 41 + 48$

Exercise 72
$19 + 73 + 23 + 71$

Exercise 73 *(Solution on p. 9.)*
$27 + 62 + 59 + 31$

Exercise 74
$18 + 73 + 69 + 19$

Exercise 75 *(Solution on p. 9.)*
$83 + 49 + 79 + 52$

Exercise 76
$67 + 71 + 84 + 81$

Exercise 77 *(Solution on p. 9.)*
$16 + 13 + 24 + 26$

Exercise 78
$34 + 56 + 36 + 55$

Exercise 79 *(Solution on p. 9.)*
$14 + 17 + 83 + 87$

Exercise 80
$93 + 108 + 96 + 111$

Exercise 81 *(Solution on p. 9.)*
$18 + 20 + 31 + 29 + 24 + 38$

Exercise 82
$32 + 27 + 48 + 51 + 72 + 69$

Exercise 83 *(Solution on p. 9.)*
$64 + 17 + 27 + 59 + 31 + 21$

Exercise 84
$81 + 41 + 92 + 38 + 88 + 80$

Exercise 85 *(Solution on p. 9.)*
$87 + 22 + 91$

Exercise 86
$44 + 38 + 87$

Exercise 87 *(Solution on p. 9.)*
$19 + 18 + 39 + 22 + 42$

Exercise 88
$31 + 28 + 49 + 29$

Exercise 89 *(Solution on p. 9.)*
$88 + 86 + 27 + 91 + 29$

Exercise 90
$57 + 62 + 18 + 23 + 61 + 21$

[2] "Techniques of Estimation: Estimation by Clustering" <http://cnx.org/content/m35012/latest/>

1.3 Mental Arithmetic- Using the Distributive Property (here[3])

For problems 91-110, compute each product using the distributive property.

Exercise 91 *(Solution on p. 9.)*
$15 \cdot 33$

Exercise 92
$15 \cdot 42$

Exercise 93 *(Solution on p. 9.)*
$35 \cdot 36$

Exercise 94
$35 \cdot 28$

Exercise 95 *(Solution on p. 9.)*
$85 \cdot 23$

Exercise 96
$95 \cdot 11$

Exercise 97 *(Solution on p. 9.)*
$30 \cdot 14$

Exercise 98
$60 \cdot 18$

Exercise 99 *(Solution on p. 9.)*
$75 \cdot 23$

Exercise 100
$65 \cdot 31$

Exercise 101 *(Solution on p. 10.)*
$17 \cdot 15$

Exercise 102
$38 \cdot 25$

Exercise 103 *(Solution on p. 10.)*
$14 \cdot 65$

Exercise 104
$19 \cdot 85$

Exercise 105 *(Solution on p. 10.)*
$42 \cdot 60$

Exercise 106
$81 \cdot 40$

Exercise 107 *(Solution on p. 10.)*
$15 \cdot 105$

Exercise 108
$35 \cdot 202$

Exercise 109 *(Solution on p. 10.)*
$45 \cdot 306$

Exercise 110
$85 \cdot 97$

[3] "Techniques of Estimation: Mental Arithmetic- Using the Distibutive Property" <http://cnx.org/content/m35013/latest/>

1.4 Estimation by Rounding Fractions (here[4])

For problems 111-125, estimate each sum using the method of rounding fractions. After you have made an estimate, find the exact value. Compare the exact and estimated values. Results may vary.

Exercise 111 *(Solution on p. 10.)*
$\frac{3}{8} + \frac{5}{6}$

Exercise 112
$\frac{7}{16} + \frac{1}{24}$

Exercise 113 *(Solution on p. 10.)*
$\frac{7}{15} + \frac{13}{30}$

Exercise 114
$\frac{14}{15} + \frac{19}{20}$

Exercise 115 *(Solution on p. 10.)*
$\frac{13}{25} + \frac{7}{30}$

Exercise 116
$\frac{11}{12} + \frac{7}{8}$

Exercise 117 *(Solution on p. 10.)*
$\frac{9}{32} + \frac{15}{16}$

Exercise 118
$\frac{5}{8} + \frac{1}{32}$

Exercise 119 *(Solution on p. 10.)*
$2\frac{3}{4} + 6\frac{3}{5}$

Exercise 120
$4\frac{5}{9} + 8\frac{1}{27}$

Exercise 121 *(Solution on p. 10.)*
$11\frac{5}{18} + 7\frac{22}{45}$

Exercise 122
$14\frac{19}{36} + 2\frac{7}{18}$

Exercise 123 *(Solution on p. 10.)*
$6\frac{1}{20} + 2\frac{1}{10} + 8\frac{13}{60}$

Exercise 124
$5\frac{7}{8} + 1\frac{1}{4} + 12\frac{5}{12}$

Exercise 125 *(Solution on p. 10.)*
$10\frac{1}{2} + 6\frac{15}{16} + 8\frac{19}{80}$

[4] "Techniques of Estimation: Estimation by Rounding Fractions" <http://cnx.org/content/m35014/latest/>

Solutions to Exercises in this Module

Solution to Exercise (p. 1)
600 (598)
Solution to Exercise (p. 1)
(1,200)
Solution to Exercise (p. 1)
4,900 (4,944)
Solution to Exercise (p. 1)
3,800 (3,760)
Solution to Exercise (p. 2)
6,050 (6,017)
Solution to Exercise (p. 2)
6,700 (6,718)
Solution to Exercise (p. 2)
61,400 (61,337)
Solution to Exercise (p. 2)
89,700 (89,718)
Solution to Exercise (p. 2)
213,000 (213,022)
Solution to Exercise (p. 2)
3,900 (3,935)
Solution to Exercise (p. 2)
2,400 (2,583)
Solution to Exercise (p. 2)
600 (504)
Solution to Exercise (p. 2)
150,123 147,000 (150,123)
Solution to Exercise (p. 2)
47,278 48,000 (47,278)
Solution to Exercise (p. 2)
12,771 14,100 (12,711)
Solution to Exercise (p. 3)
8,100 (9,768)
Solution to Exercise (p. 3)
90,000 (86,784)
Solution to Exercise (p. 3)
396,000 (386,496)
Solution to Exercise (p. 3)
1,609,048 1,560,000 (1,609,048)
Solution to Exercise (p. 3)
22,050,000 (22,164,232)
Solution to Exercise (p. 3)
18 (15)
Solution to Exercise (p. 3)
$14\frac{1}{2}$ (13)
Solution to Exercise (p. 3)
50 (53)
Solution to Exercise (p. 3)
54 (51)

Solution to Exercise (p. 3)
130 (105)
Solution to Exercise (p. 3)
41.25 (44)
Solution to Exercise (p. 4)
42 (43)
Solution to Exercise (p. 4)
14.4 (14)
Solution to Exercise (p. 4)
60 (61)
Solution to Exercise (p. 4)
1,000 (992)
Solution to Exercise (p. 4)
71.1 (71.17)
Solution to Exercise (p. 4)
119.4 (119.31)
Solution to Exercise (p. 4)
272 (271.8)
Solution to Exercise (p. 4)
2,001 (2,020.952)
Solution to Exercise (p. 4)
4.16 (3.9596)
Solution to Exercise (p. 5)
$2(40) + 2(50) = 180$ (178)
Solution to Exercise (p. 5)
$2(30) + 2(60) = 180$ (179)
Solution to Exercise (p. 5)
$2(80) + 2(50) = 260$ (263)
Solution to Exercise (p. 5)
$3(20) + 1(10) = 70$ (79)
Solution to Exercise (p. 5)
$2(15) + 2(80) = 190$ (201)
Solution to Exercise (p. 5)
$3(20) + 2(30) + 40 = 160$ (160)
Solution to Exercise (p. 5)
$2(60) + 2(20) + 2(30) = 220$ (219)
Solution to Exercise (p. 5)
$2(90) + 20 = 200$ (200)
Solution to Exercise (p. 5)
$3(20) + 2(40) = 140$ (140)
Solution to Exercise (p. 5)
$3(90) + 2(30) = 330$ (321)
Solution to Exercise (p. 6)
$15(30 + 3) = 450 + 45 = 495$
Solution to Exercise (p. 6)
$35(40 - 4) = 1400 - 140 = 1,260$
Solution to Exercise (p. 6)
$85(20 + 3) = 1,700 + 225 = 1,955$
Solution to Exercise (p. 6)
$30(10 + 4) = 300 + 120 = 420$

Solution to Exercise (p. 6)
$75\,(20+3) = 1,500 + 225 = 1,725$
Solution to Exercise (p. 6)
$15\,(20-3) = 300 - 45 = 255$
Solution to Exercise (p. 6)
$65\,(10+4) = 650 + 260 = 910$
Solution to Exercise (p. 6)
$60\,(40+2) = 2,400 + 120 = 2,520$
Solution to Exercise (p. 6)
$15\,(100+5) = 1,500 + 75 = 1,575$
Solution to Exercise (p. 6)
$45\,(300+6) = 13,500 + 270 = 13,770$
Solution to Exercise (p. 7)
$\frac{1}{2} + 1 = 1\frac{1}{2}\left(1\frac{5}{24}\right)$
Solution to Exercise (p. 7)
$\frac{1}{2} + \frac{1}{2} = 1\ \left(\frac{27}{30} \text{ or } \frac{9}{10}\right)$
Solution to Exercise (p. 7)
$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}\left(\frac{113}{150}\right)$
Solution to Exercise (p. 7)
$\frac{1}{4} + 1 = 1\frac{1}{4}\left(\frac{39}{32} \text{ or } \ 1\frac{7}{32}\right)$
Solution to Exercise (p. 7)
$2\frac{3}{4} + 6\frac{1}{2} = 9\frac{1}{4}\left(9\frac{7}{20}\right)$
Solution to Exercise (p. 7)
$11\frac{1}{4} + 7\frac{1}{2} = 18\frac{3}{4}\left(18\frac{23}{30}\right)$
Solution to Exercise (p. 7)
$6 + 2 + 8\frac{1}{4} = 16\frac{1}{4}\left(16\frac{11}{30}\right)$
Solution to Exercise (p. 7)
$10\frac{1}{2} + 7 + 8\frac{1}{4} = 25\frac{3}{4}\left(25\frac{27}{40}\right)$