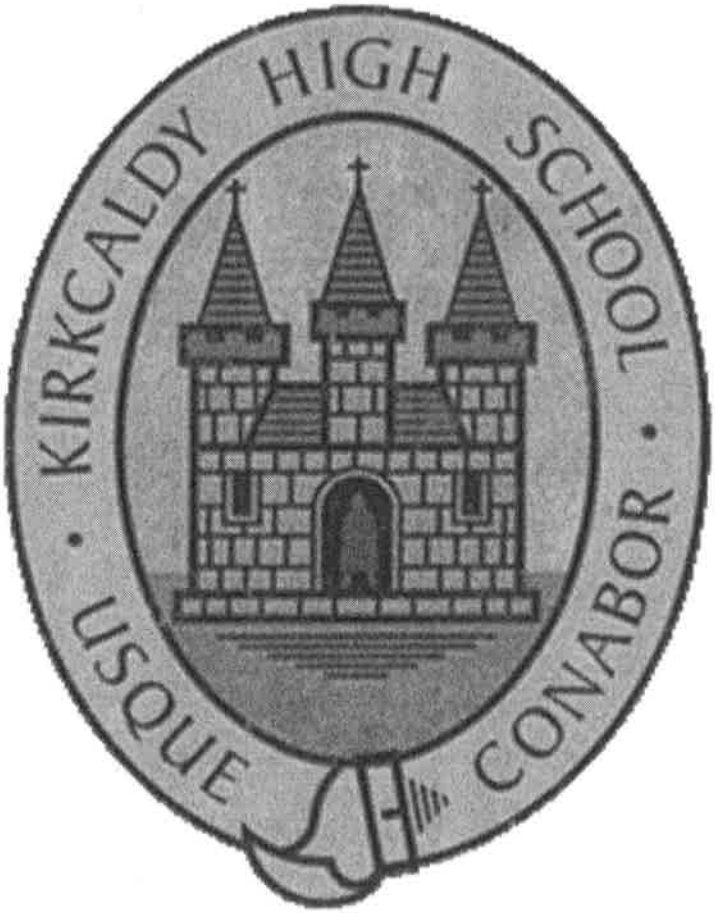
Phase C (L4)

Winter Assessment



Revision Booklet

Contents

Chapter 1

Phase C Winter Assessment [redacted] BODMAS, Estimation + Rounding Questions

1. Evaluate

a)

i 6 x 3 + 2

ii 7 – 3 x 6

iii 5 + 3 x 4

iv 9 x 2 – 5

v 8 x 4 – 3

vi 4 – 3 x 2

b)

i 8 ÷ (4 – 2)

ii 10 ÷ (7 – 2)

iii (4 + 8) x 6

iv 5 x (5 + 5)

v (8 + 4) x (9 – 7)

vi 12 ÷ (10 – 6)

c) The equations below are incorrect. Draw some brackets to make the equations true

i 24 – 3 x 6 + 8 = 14

ii 6 x 7 – 3 – 4 = 20

iii 5 + 8 – 3 x 3 = 20

iv 22 – 3 x 6 – 5 = 19

v 8 x 4 + 5 – 7 = 65

iv 2 x 9 – 6 + 12 = 18

2. Estimate – DO NOT CALCULATE THE EXACT ANSWER – ESTIMATE

   a) 3.8 + 5.1

   b) 5.9 + 6.2

   c) 11.2 + 7.7

   d) 22 + 51

   e) 58 + 39

   f) 19 + 62

3. Rounding – Multiple choice, circle your answer

   a) Round 38.6518 to 1 decimal place 38 39 38.7 38.6 38.65 39

   b) Round 21.3872 to 1 decimal place 21 22 21.3 21.4 22.38 22.387

   c) Round 54.5692 to 2 decimal places 54 55 55.5 55.6 54.56 54.57

   d) Round 181.1415 to 2 decimal places 181 182 181.1 181.14 181.15 181.141

   e) Round 256.3823 to the nearest hundred 200 300 250 260 256.3 256.38

   f) Round 1187.3832 to the nearest hundred 1187 1187.38 1187.383 1180 1200

   g) Round 7335 to 2 significant figures 7335 7330 7300 7333 7000 7350

   h) Round 1252 to 2 significant figures 1252 1250 1000 2000 1200 1300

1. Evaluate

a)

i $6 \times 3 + 2 = 20$

ii $7 - 3 \times 6 = -11$

iii $5 + 3 \times 4 = 17$

iv $9 \times 2 - 5 = 13$

v $8 \times 4 - 3 = 29$

vi $4 - 3 \times 2 = -2$

b)

i $8 \div (4 - 2) = 4$

ii $10 \div (7 - 2) = 2$

iii $(4 + 8) \times 6 = 72$

iv $5 \times (5 + 5) = 50$

v $(8 + 4) \times (9 - 7) = 24$

vi $12 \div (10 - 6) = 3$

c) The equations below are incorrect. Draw some brackets to make the equations true

i $24 - (3 \times 6) + 8 = 14$

ii $6 \times (7 - 3) - 4 = 20$

iii $5 + (8 - 3) \times 3 = 20$

iv $22 - 3 \times (6 - 5) = 19$

v $8 \times (4 + 5) - 7 = 65$

iv $2 \times (9 - 6) + 12 = 18$

2. Estimate – DO NOT CALCULATE THE EXACT ANSWER – ESTIMATE

a) 3.8 + 5.1 = 9

b) 5.9 + 6.2 = 12

c) 11.2 + 7.7 = 19

d) 22 + 51 = 70

e) 58 + 39 = 100

f) 19 + 62 = 80

3. Rounding – Multiple choice, circle your answer

a) Round 38.6518 to 1 decimal place	38	39	(38.7)	38.6	38.65	39
b) Round 21.3872 to 1 decimal place	21	22	21.3	(21.4)	22.38	22.387
c) Round 54.5692 to 2 decimal places	54	55	55.5	55.6	55.56	(54.57)
d) Round 181.1415 to 2 decimal places	181	182	181.1	(181.14)	181.15	181.141
e) Round 256.3823 to the nearest hundred	200	(300)	250	260	256.3	256.38
f) Round 1187.3832 to the nearest hundred	1187	1187.38	1187.383	1180	(1200)	
g) Round 7335 to 2 significant figures	7335	7330	(7300)	7333	7000	7350
h) Round 1252 to 2 significant figures	1252	1250	1000	2000	1200	(1300)

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Adding Fractions

1) $\frac{1}{2} + \frac{1}{4} =$

2) $\frac{3}{4} + \frac{3}{10} =$

3) $\frac{3}{4} + \frac{1}{10} =$

4) $\frac{1}{2} + \frac{3}{4} =$

5) $\frac{2}{5} + \frac{1}{2} =$

6) $\frac{3}{4} + \frac{3}{5} =$

7) $\frac{1}{4} + \frac{1}{2} =$

8) $\frac{1}{4} + \frac{9}{10} =$

9) $\frac{1}{3} + \frac{1}{4} =$

10) $\frac{1}{2} + \frac{7}{10} =$

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Adding Fractions

1) $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

2) $\frac{3}{4} + \frac{3}{10} = \frac{15}{20} + \frac{6}{20} = \frac{21}{20} = 1\frac{1}{20}$

3) $\frac{3}{4} + \frac{1}{10} = \frac{15}{20} + \frac{2}{20} = \frac{17}{20}$

4) $\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}$

5) $\frac{2}{5} + \frac{1}{2} = \frac{4}{10} + \frac{5}{10} = \frac{9}{10}$

6) $\frac{3}{4} + \frac{3}{5} = \frac{15}{20} + \frac{12}{20} = \frac{27}{20} = 1\frac{7}{20}$

7) $\frac{1}{4} + \frac{1}{2} = \frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

8) $\frac{1}{4} + \frac{9}{10} = \frac{5}{20} + \frac{18}{20} = \frac{23}{20} = 1\frac{3}{20}$

9) $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

10) $\frac{1}{2} + \frac{7}{10} = \frac{5}{10} + \frac{7}{10} = \frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$

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Multiplying Fractions

1) $\frac{2}{5} \times \frac{2}{3} =$

2) $\frac{3}{4} \times \frac{1}{3} =$

3) $\frac{1}{2} \times \frac{2}{3} =$

4) $\frac{1}{4} \times \frac{1}{5} =$

5) $\frac{5}{10} \times \frac{1}{3} =$

6) $\frac{1}{3} \times \frac{3}{5} =$

7) $\frac{2}{4} \times \frac{3}{10} =$

8) $\frac{1}{3} \times \frac{1}{2} =$

9) $\frac{2}{3} \times \frac{1}{5} =$

10) $\frac{1}{5} \times \frac{1}{10} =$

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Multiplying Fractions

1) $\frac{2}{5} \times \frac{2}{3} = \frac{2 \times 2}{5 \times 3} = \frac{4}{15}$

2) $\frac{3}{4} \times \frac{1}{3} = \frac{3 \times 1}{4 \times 3} = \frac{3}{12} = \frac{1}{4}$

3) $\frac{1}{2} \times \frac{2}{3} = \frac{1 \times 2}{2 \times 3} = \frac{2}{6} = \frac{1}{3}$

4) $\frac{1}{4} \times \frac{1}{5} = \frac{1 \times 1}{4 \times 5} = \frac{1}{20}$

5) $\frac{5}{10} \times \frac{1}{3} = \frac{5 \times 1}{10 \times 3} = \frac{5}{30} = \frac{1}{6}$

6) $\frac{1}{3} \times \frac{3}{5} = \frac{1 \times 3}{3 \times 5} = \frac{3}{15} = \frac{1}{5}$

7) $\frac{2}{4} \times \frac{3}{10} = \frac{2 \times 3}{4 \times 10} = \frac{6}{40} = \frac{3}{20}$

8) $\frac{1}{3} \times \frac{1}{2} = \frac{1 \times 1}{3 \times 2} = \frac{1}{6}$

9) $\frac{2}{3} \times \frac{1}{5} = \frac{2 \times 1}{3 \times 5} = \frac{2}{15}$

10) $\frac{1}{5} \times \frac{1}{10} = \frac{1 \times 1}{5 \times 10} = \frac{1}{50}$

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Dividing Fractions

1) $\frac{2}{5} \div \frac{1}{4} =$

2) $\frac{2}{5} \div \frac{4}{10} =$

3) $\frac{4}{5} \div \frac{2}{4} =$

4) $\frac{1}{2} \div \frac{2}{4} =$

5) $\frac{5}{10} \div \frac{2}{4} =$

6) $\frac{1}{5} \div \frac{1}{2} =$

7) $\frac{6}{10} \div \frac{1}{4} =$

8) $\frac{3}{10} \div \frac{1}{2} =$

9) $\frac{3}{10} \div \frac{2}{3} =$

10) $\frac{1}{2} \div \frac{1}{3} =$

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Dividing Fractions

1) $\frac{2}{5} \div \frac{1}{4} = \frac{2 \times 4}{5 \times 1} = \frac{8}{5} = 1\frac{3}{5}$

2) $\frac{2}{5} \div \frac{4}{10} = \frac{2 \times 10}{5 \times 4} = \frac{20}{20} = 1$

3) $\frac{4}{5} \div \frac{2}{4} = \frac{4 \times 4}{5 \times 2} = \frac{16}{10} = \frac{8}{5} = 1\frac{3}{5}$

4) $\frac{1}{2} \div \frac{2}{4} = \frac{1 \times 4}{2 \times 2} = \frac{4}{4} = 1$

5) $\frac{5}{10} \div \frac{2}{4} = \frac{5 \times 4}{10 \times 2} = \frac{20}{20} = 1$

6) $\frac{1}{5} \div \frac{1}{2} = \frac{1 \times 2}{5 \times 1} = \frac{2}{5}$

7) $\frac{6}{10} \div \frac{1}{4} = \frac{6 \times 4}{10 \times 1} = \frac{24}{10} = \frac{12}{5} = 2\frac{2}{5}$

8) $\frac{3}{10} \div \frac{1}{2} = \frac{3 \times 2}{10 \times 1} = \frac{6}{10} = \frac{3}{5}$

9) $\frac{3}{10} \div \frac{2}{3} = \frac{3 \times 3}{10 \times 2} = \frac{9}{20}$

10) $\frac{1}{2} \div \frac{1}{3} = \frac{1 \times 3}{2 \times 1} = \frac{3}{2} = 1\frac{1}{2}$

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Converting Improper Fractions to Mixed Numbers

1) $\frac{54}{10}$ = ____ 2) $\frac{23}{6}$ = ____ 3) $\frac{11}{4}$ = ____

4) $\frac{33}{9}$ = ____ 5) $\frac{19}{5}$ = ____ 6) $\frac{10}{3}$ = ____

7) $\frac{53}{7}$ = ____ 8) $\frac{45}{6}$ = ____ 9) $\frac{33}{8}$ = ____

10) $\frac{18}{4}$ = ____ 11) $\frac{46}{7}$ = ____ 12) $\frac{13}{6}$ = ____

13) $\frac{7}{2}$ = ____ 14) $\frac{36}{5}$ = ____ 15) $\frac{77}{10}$ = ____

Converting Mixed Numbers to Improper Fractions

1) $6\frac{3}{4}$ = ____ 2) $5\frac{1}{9}$ = ____ 3) $9\frac{1}{7}$ = ____

4) $3\frac{3}{4}$ = ____ 5) $4\frac{3}{10}$ = ____ 6) $9\frac{5}{8}$ = ____

7) $7\frac{5}{8}$ = ____ 8) $5\frac{1}{2}$ = ____ 9) $9\frac{3}{10}$ = ____

10) $7\frac{1}{5}$ = ____ 11) $5\frac{1}{2}$ = ____ 12) $8\frac{1}{2}$ = ____

13) $9\frac{2}{3}$ = ____ 14) $2\frac{4}{9}$ = ____ 15) $9\frac{2}{3}$ = ____

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Converting Improper Fractions to Mixed Numbers

1) $\frac{54}{10} = 5\frac{2}{5}$ 2) $\frac{23}{6} = 3\frac{5}{6}$ 3) $\frac{11}{4} = 2\frac{3}{4}$

4) $\frac{33}{9} = 3\frac{2}{3}$ 5) $\frac{19}{5} = 3\frac{4}{5}$ 6) $\frac{10}{3} = 3\frac{1}{3}$

7) $\frac{53}{7} = 7\frac{4}{7}$ 8) $\frac{45}{6} = 7\frac{1}{2}$ 9) $\frac{33}{8} = 4\frac{1}{8}$

10) $\frac{18}{4} = 4\frac{1}{2}$ 11) $\frac{46}{7} = 6\frac{4}{7}$ 12) $\frac{13}{6} = 2\frac{1}{6}$

13) $\frac{7}{2} = 3\frac{1}{2}$ 14) $\frac{36}{5} = 7\frac{1}{5}$ 15) $\frac{77}{10} = 7\frac{7}{10}$

Converting Mixed Numbers to Improper Fractions

1) $6\frac{3}{4} = \frac{27}{4}$ 2) $5\frac{1}{9} = \frac{46}{9}$ 3) $9\frac{1}{7} = \frac{64}{7}$

4) $3\frac{3}{4} = \frac{15}{4}$ 5) $4\frac{3}{10} = \frac{43}{10}$ 6) $9\frac{5}{8} = \frac{77}{8}$

7) $7\frac{5}{8} = \frac{61}{8}$ 8) $5\frac{1}{2} = \frac{11}{2}$ 9) $9\frac{3}{10} = \frac{93}{10}$

10) $7\frac{1}{5} = \frac{36}{5}$ 11) $5\frac{1}{2} = \frac{11}{2}$ 12) $8\frac{1}{2} = \frac{17}{2}$

13) $9\frac{2}{3} = \frac{29}{3}$ 14) $2\frac{4}{9} = \frac{22}{9}$ 15) $9\frac{2}{3} = \frac{29}{3}$

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Common Percent Table

Fraction	Decimal	Percent
		5 %
	0.1	
	0.125	
$\frac{1}{5}$		
		25 %
$\frac{3}{10}$		
	$0.\overline{3}$	
	0.375	
$\frac{2}{5}$		
$\frac{1}{2}$		
$\frac{3}{5}$		
$\frac{5}{8}$		
		$66\frac{2}{3}$ %
	0.7	
	0.75	
	0.8	
		90 %

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Common Percent Table

Fraction	Decimal	Percent
$\frac{1}{20}$	0.05	5 %
$\frac{1}{10}$	0.1	10 %
$\frac{1}{8}$	0.125	$12\frac{1}{2}$ %
$\frac{1}{5}$	0.2	20 %
$\frac{1}{4}$	0.25	25 %
$\frac{3}{10}$	0.3	30 %
$\frac{1}{3}$	$0.\overline{3}$	$33\frac{1}{3}$ %
$\frac{3}{8}$	0.375	$37\frac{1}{2}$ %
$\frac{2}{5}$	0.4	40 %
$\frac{1}{2}$	0.5	50 %
$\frac{3}{5}$	0.6	60 %
$\frac{5}{8}$	0.625	$62\frac{1}{2}$ %
$\frac{2}{3}$	$0.\overline{6}$	$66\frac{2}{3}$ %
$\frac{7}{10}$	0.7	70 %
$\frac{3}{4}$	0.75	75 %
$\frac{4}{5}$	0.8	80 %
$\frac{9}{10}$	0.9	90 %

Name Date

FIND SIMPLE PERCENTAGES SHEET 3

Find these percentages of numbers.

A) 50% and 100%

1)	50% of 7 =	2)	100% of 1.8 =	3)	50% of 13 =
4)	100% of 8.1 =	5)	50% of 138 =	6)	100% of 9.7 =
7)	50% of 3.2 =	8)	100% of 134 =	9)	50% of 6.8 =
10)	100% of 4.9 =	11)	50% of 98 =	12)	50% of 12.4 =

B) 1% and 10%

1)	10% of 67 =	2)	1% of 72 =	3)	1% of 430 =
4)	10% of 32 =	5)	1% of 39 =	6)	10% of 8.3 =
7)	1% of 5 =	8)	10% of 327 =	9)	10% of 56.4 =
10)	1% of 726 =	11)	1% of 318 =	12)	10% of 731 =

C) 1%, 10%, 50% and 100%

1)	10% of 75 =	2)	50% of 4.8 =	3)	100% of 6.3 =
4)	1% of 63 =	5)	10% of 426 =	6)	1% of 738 =
7)	50% of 324 =	8)	100% of 8.9 =	9)	10% of 625 =
10)	1% of 58 =	11)	50% of 8.2 =	12)	10% of 7.6 =
13)	100% of 7.4 =	14)	1% of 615 =	15)	10% of 538 =

Name Date

FIND SIMPLE PERCENTAGES SHEET 3 ANSWERS

A) 50% and 100%

1)	50% of 7 = **3.5**	2)	100% of 1.8 = **1.8**	3)	50% of 13 = **6.5**
4)	100% of 8.1 = **8.1**	5)	50% of 138 = **69**	6)	100% of 9.7 = **9.7**
7)	50% of 3.2 = **1.6**	8)	100% of 134 = **134**	9)	50% of 6.8 = **3.4**
10)	100% of 4.9 = **4.9**	11)	50% of 98 = **49**	12)	50% of 12.4 = **6.2**

B) 1% and 10%

1)	10% of 67 = **6.7**	2)	1% of 72 = **0.72**	3)	1% of 430 = **4.3**
4)	10% of 32 = **3.2**	5)	1% of 39 = **0.39**	6)	10% of 8.3 = **0.83**
7)	1% of 5 = **0.05**	8)	10% of 327 = **32.7**	9)	10% of 56.4 = **5.64**
10)	1% of 726 = **7.26**	11)	1% of 318 = **3.18**	12)	10% of 731 = **73.1**

C) 1%, 10%, 50% and 100%

1)	10% of 75 = **7.5**	2)	50% of 4.8 = **2.4**	3)	100% of 6.3 = **6.3**
4)	1% of 63 = **0.63**	5)	10% of 426 = = **42.6**	6)	1% of 738 = **7.38**
7)	50% of 324 = **162**	8)	100% of 8.9 = **8.9**	9)	10% of 625 = **62.5**
10)	1% of 58 = **0.58**	11)	50% of 8.2 = **4.1**	12)	10% of 7.6 = **0.76**
13)	100% of 7.4 = **7.4**	14)	1% of 615 = **6.15**	15)	10% of 538 = **53.8**

Name Date

FINDING PERCENTAGES SHEET 1

Find these percentages of numbers.

A) Multiples of 1%

1)	1% of 500	=	2)	3% of 500	=	3)	6% of 500	=
4)	1% of 130	=	5)	2% of 130	=	6)	5% of 130	=
7)	1% of 200	=	8)	4% of 200	=	9)	9% of 200	=
10)	1% of 250	=	11)	3% of 250	=	12)	6% of 250	=

B) Multiples of 10%

1)	10% of 80	=	2)	30% of 80	=	3)	50% of 80	=
4)	10% of 120	=	5)	20% of 120	=	6)	60% of 120	=
7)	10% of 70	=	8)	30% of 70	=	9)	90% of 70	=
10)	10% of 220	=	11)	30% of 220	=	12)	40% of 220	=

C) Mixed

1)	10% of 40	=	2)	3% of 400	=	3)	20% of 70	=
4)	7% of 20	=	5)	60% of 50	=	6)	5% of 200	=
7)	1% of 900	=	8)	30% of 200	=	9)	8% of 30	=
10)	20% of 130	=	11)	6% of 400	=	12)	8% of 600	=
13)	40% of 70	=	14)	90% of 50	=	15)	7% of 1100	=

Name Date

FINDING PERCENTAGES SHEET 1 ANSWERS

A) Multiples of 1%

1)	1% of 500	= **5**	2)	3% of 500	= **15**	3)	6% of 500	= **30**
4)	1% of 130	= **1.3**	5)	2% of 130	= **2.6**	6)	5% of 130	= **6.5**
7)	1% of 200	= **2**	8)	4% of 200	= **8**	9)	9% of 200	= **18**
10)	1% of 250	= **2.5**	11)	3% of 250	= **7.5**	12)	6% of 250	= **15**

B) Multiples of 10%

1)	10% of 80	= **8**	2)	30% of 80	= **24**	3)	50% of 80	= **40**
4)	10% of 120	= **12**	5)	20% of 120	= **24**	6)	60% of 120	= **72**
7)	10% of 70	= **7**	8)	30% of 70	= **21**	9)	90% of 70	= **63**
10)	10% of 220	= **22**	11)	30% of 220	= **66**	12)	40% of 220	= **88**

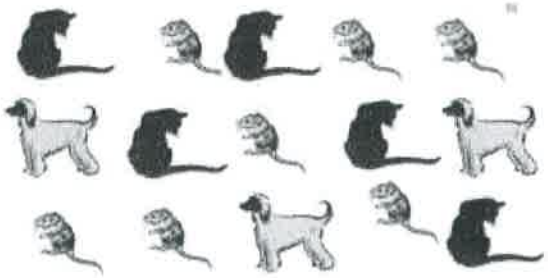
C) Mixed

1)	10% of 40	= **4**	2)	3% of 400	= **12**	3)	20% of 70	= **14**
4)	7% of 20	= **1.4**	5)	60% of 50	= **30**	6)	5% of 200	= **10**
7)	1% of 900	= **9**	8)	30% of 200	= **60**	9)	8% of 30	= **24**
10)	20% of 130	= **26**	11)	6% of 400	= **24**	12)	8% of 600	= **48**
13)	40% of 70	= **28**	14)	90% of 50	= **45**	15)	7% of 1100	= **77**

Ratio & Proportion

1. Look at the picture.

   Write down the ratio of :-



   a cats to dogs ____ : ____

   b cats to mice ____ : ____

   c dogs to cats ____ : ____

   d dogs to mice ____ : ____

   e mice to cats ____ : ____

   f mice to animals ____ : ____

2. From the picture, write in simplest form the ratio of :-

   a oranges to pears ____ : ____

   b bananas to pears ____ : ____

   c pears to bananas ____ : ____

   d pears to oranges ____ : ____

   e bananas to fruit ____ : ____

3. Look at the picture opposite and write down the ratio of :-

   a spoons : forks ____ : ____

   b forks : knives ____ : ____

   c knives : spoons ____ : ____

★

Divide

1) £20 in the ratio 1 : 3

2) £42 in the ratio 2 : 5

3) £36 in the ratio 4 : 5

4) £108 in the ratio 7 : 5

5) 450 g in the ratio 2 : 13

6) 2 kg in the ratio 3 : 5

7) £16.80 in the ratio 2 : 1

8) 2.5 m in the ratio 3 : 2

★★

Divide

1) £24 in the ratio 1:2:3

2) £56 in the ratio 2:3:3

3) £360 in the ratio 2:3:4

4) £108 in the ratio 5:3:4

5) 350 g in the ratio 2:4:1

6) 5 kg in the ratio 4:9:12

7) £90 in the ratio 7:13:10

8) 1.8 m in the ratio 3:2:4

★★★

1) A bag of sweets is shared between Anne and Bobby in the ratio 3:5. If Anne gets 21 sweets how many sweets does Bobby get?

2) Craig and Dom share some money in the ratio 2:7. If Dom gets £250 more than Craig how much money did they share?

3) The number of 5p, 10p, and 20p coins in a jar are in the ratio 7 : 4 : 3. If there are 5p coins are worth 70p calculate the total value of the money in the jar.

★

1) If 4 boxes contain 192 pins, how many pins would there be in 5 boxes?

2) If 15 beads cost £5.25, how much will it cost for 20 beads?

3) If 20 blocks weight 44 kg, how much would 12 blocks weigh?

4) If it takes Tom 2 minutes 20 to eat 7 biscuits, how long would it take him to eat 10 (at the same rate)?

5) If 15 metres of rope costs £22.50, how much would 12 metres cost?

★★

1) If 10 people can paint a fence in 3 days, how long would it take 6 people?

2) If it takes 5 workers 16 hours to paint a church hall, hoe long would it take 8 workers?

3) If it takes 2 gardeners 6 hours to landscape a garden, how long would it take 3 gardeners?

4) If it takes 3 florists, 2 hours 15 minutes to arrange flours for a wedding, how long would it take 5 florists?

5) If it takes 9 workers 7 days to pack a container, how long would it take 6 workers?

★★★

1) 280 grams of flour are needed to make 8 cakes. Nani has 500g of flour. Does she have enough to make 15 cakes?

2) 5 workers are scheduled to complete a project that will take 6 days. If one of the workers is unavailable, how much longer will the project take?

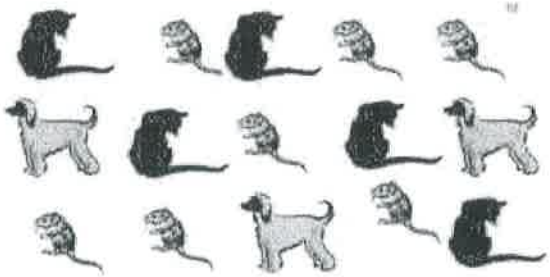
3) A car travels 4 miles is 5 minutes. If it maintains this speed how far will it travel in 1 hour?

4) 3 machines can pack 270 boxes in 15 minutes. How many boxes would be packed if 5 machines worked at this rate for 1 hour?

Ratio & Proportion

1. Look at the picture.

   Write down the ratio of :-



   a cats to dogs **5 : 3**

   b cats to mice **5 : 7**

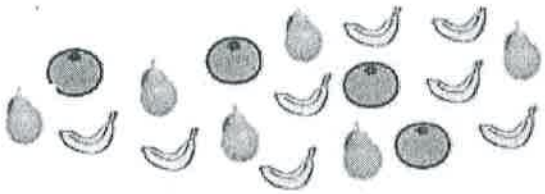
   c dogs to cats **3 : 5**

   d dogs to mice **3 : 7**

   e mice to cats **7 : 5**

   f mice to animals **7 : 15**

2. From the picture, write in simplest form the ratio of :-



   a oranges to pears **2 : 3** 4:6

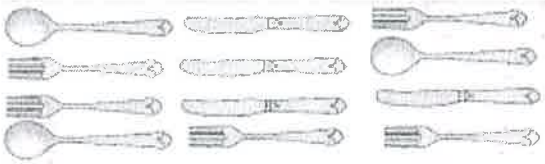
   b bananas to pears **4 : 3** 8:6

   c pears to bananas **3 : 4** 6:8

   d pears to oranges **3 : 2** 6:4

   e bananas to fruit **4 : 9** 8:18

3. Look at the picture opposite and write down the ratio of :-



   a spoons : forks **3 : 5** 3:5

   b forks : knives **5 : 4**

   c knives : spoons **4 : 3**

Divide

1) £20 in the ratio 1 : 3
5 : 15

2) £42 in the ratio 2 : 5
12 : 30

3) £36 in the ratio 4 : 5
16 : 20

4) £108 in the ratio 7 : 5
63 : 45

5) 450 g in the ratio 2 : 13
60 : 390

6) 2 kg in the ratio 3 : 5
0·75 : 1·25

7) £16.80 in the ratio 2 : 1
£11·20 : 5·60

8) 2.5 m in the ratio 3 : 2
1·5 : 1

Divide

1) £24 in the ratio 1:2:3
4 : 8 : 12

2) £56 in the ratio 2:3:3
14 : 21 : 21

3) £360 in the ratio 2:3:4
80 : 120 : 160

4) £108 in the ratio 5:3:4
45 : 27 : 36

5) 350 g in the ratio 2:4:1
100 : 200 : 50

6) 5 kg in the ratio 4:9:12
0·8 : 1·8 : 2·4

7) £90 in the ratio 7:13:10
21 : 39 : 30

8) 1.8 m in the ratio 3:2:4
0·6 : 0·4 : 0·8

1) A bag of sweets is shared between Anne and Bobby in the ratio 3:5. If Anne gets 21 sweets how many sweets does Bobby get?
35

2) Craig and Dom share some money in the ratio 2:7. If Dom gets £250 more than Craig how much money did they share?
100 : 350
= £450

3) The number of 5p, 10p, and 20p coins in a jar are in the ratio 7 : 4 : 3. If there are 5p coins are worth 70p calculate the total value of the money in the jar.
5p : 10p : 20p
7 : 4 : 3
70p : 80p : £1·20
£2·70
Coins 14 : 8 : 6

★

1) If 4 boxes contain 192 pins, how many pins would there be in 5 boxes? 240

2) If 15 beads cost £5.25, how much will it cost for 20 beads? 7

3) If 20 blocks weight 44 kg, how much would 12 blocks weigh? 26·4kg.

4) If it takes Tom 2 minutes 20 to eat 7 biscuits, how long would it take him to eat 10 (at the same rate)? 140secs 200secs 3min 20.

5) If 15 metres of rope costs £22.50, how much would 12 metres cost? 18

★★

1) If 10 people can paint a fence in 3 days, how long would it take 6 people? 5days.

2) If it takes 5 workers 16 hours to paint a church hall, hoe long would it take 8 workers? 10.

3) If it takes 2 gardeners 6 hours to landscape a garden, how long would it take 3 gardeners? 4

4) If it takes 3 florists, 2 hours 15 minutes to arrange flours for a wedding, how long would it take 5 florists? 81mins 1h 21s.

5) If it takes 9 workers 7 days to pack a container, how long would it take 6 workers? 10·5 days.

★★★

1) 280 grams of flour are needed to make 8 cakes. Nani has 500g of flour. Does she have enough to make 15 cakes? 35g each 525. No, 25kg short.

2) 5 workers are scheduled to complete a project that will take 6 days. If one of the workers is unavailable, how much longer will the project take? 7·5 days (+1·5).

3) A car travels 4 miles is 5 minutes. If it maintains this speed how far will it travel in 1 hour? 48miles

4) 3 machines can pack 270 boxes in 15 minutes. How many boxes would be packed if 5 machines worked at this rate for 1 hour? 810

3 machines 1 hour = 1080.
162 - 15min
648 - 1hour.

Powers (index notation) **Chapter 5: Powers + Roots**

Examples

$4^3 = 4 \times 4 \times 4 = 64$

$5^8 = 5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 = 390625$

Fill in the blanks:

1. $2^3 =$ ☐ $= 8$

2. $3^5 = 3 \times 3 \times 3 \times 3 \times 3 =$ ☐

3. ☐ $= 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$

4. $9^3 = 9 \times 9 \times 9 =$ ☐

5. $5^2 =$ ☐ $= 25$

6. ☐ $= 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7 = 1977326743$

Squares and Square Roots

$1^2 = 1$	$2^2 = 4$	$3^2 = 9$	$4^2 = 16$	$5^2 = 25$
$6^2 = 36$	$7^2 = 49$	$8^2 = 64$	$9^2 = 81$	$10^2 = 100$
$11^2 = 121$	$12^2 = 144$	$13^2 = 169$	$14^2 = 196$	$15^2 = 225$
$16^2 = 256$	$17^2 = 289$	$18^2 = 324$	$19^2 = 361$	$20^2 = 400$

1. Draw and label an arrow on the number line to show approximately the value of $\sqrt{20}$
2. Draw and label an arrow on the number line to show approximately the value of $\sqrt{180}$
3. Draw and label an arrow on the number line to show approximately the value of $\sqrt{6}$

Standard Form (Scientific Notation)

Large numbers

$3.2 \times 10^8 = 320\,000\,000$ i.e 3 followed by eight numbers, the first of which is a 2, the rest are zeroes.

$9.42 \times 10^5 = 952\,000$ i.e 9 followed by five numbers, the first of which is are 4 and 2, the rest are zeroes.

1. a. Write 2.5×10^6 in normal form.
   b. Write 7.29×10^9 in normal form.
2. a. Write 84 000 in standard form.
   b. Write 612 000 000 in standard form.

Standard Form (Scientific Notation)

Small numbers

$2.7 \times 10^{-8} = 0.00000027$ i.e 8 zeroes followed by 27. Don't forget the decimal point.

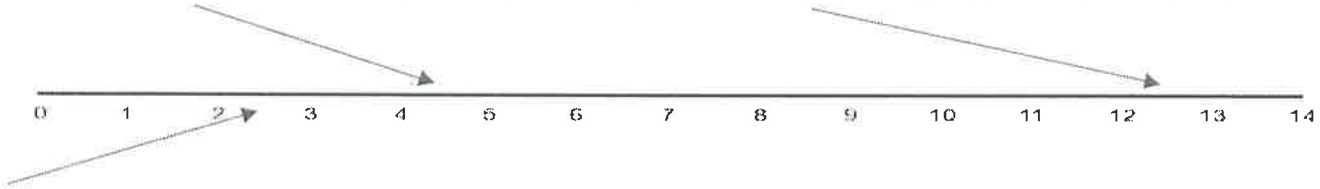
$1.39 \times 10^{-5} = 0.0000139$ i.e 5 zeroes followed by 139. Don't forget the decimal point.

3. a. Write 4.2×10^{-3} in normal form.
   b. Write 6.04×10^{-5} in normal form.
4. a. Write 0.0006 in standard form.
   b. Write 0.000000084 in standard form.

~~Answers~~ Solutions

Powers 1) 2 x 2 x 2 2) 243 3) 1^8 4) 729 5) 5 x 5 6) 7^{11}

Square roots $\sqrt{20}$ *is between* $\sqrt{16} = 4$ *and* $\sqrt{25} = 5$ $\sqrt{180}$ *is between* $\sqrt{169} = 13$ *and* $\sqrt{196} = 14$



$\sqrt{6}$ *is between* $\sqrt{4} = 2$ *and* $\sqrt{9} = 3$

Standard Form

1a) 2 500 000 1b) 7 290 000 000 2a) 8.4×10^4 2b) 6.12×10^8

3a) 0.0042 3b) 0.000604 4a) 6×10^{-4} 4b) 8.4×10^{-8}

Why Are Handcuffs Like Souvenirs?

Use the distributive property to complete each statement below. Find your answer in the corresponding answer column. Write the letter of that exercise in the box that contains the number of the answer.

(A) $7(a+b) = 7a + \_\_\_\_$

(R) $4(5+x) = 20 + \_\_\_\_$

(Y) $3(2x+9) = 6x + \_\_\_\_$

(S) $8(3x+1) = \_\_\_\_ + 8$

(O) $a(4+b) = \_\_\_\_ + ab$

(E) $x(y+10) = \_\_\_\_ + 10x$

(I) $2(7x+4y) = 14x + \_\_\_\_$

(D) $6(9+5x) = 54 + \_\_\_\_$

(W) $x(a+3b) = \_\_\_\_ + 3bx$

(E) $a(8x+2y) = 8ax + \_\_\_\_$

(T) $\frac{1}{2}(4a+10) = 2a + \_\_\_\_$

(R) $\frac{2}{3}(12+9y) = 8 + \_\_\_\_$

Answers:

(18) ax

(17) $4a$

(9) $7b$

(1) 5

(14) $4x$

(23) $24x$

(10) $30x$

(6) $6y$

(3) xy

(4) 27

(7) $2ay$

(20) $8y$

(O) $5x + 5y = 5(x + \_\_\_\_)$

(T) $9a + 9b = 9(\_\_\_\_ + b)$

(W) $4m + 4n = \_\_\_\_(m+n)$

(H) $ab + 3a = a(b + \_\_\_\_)$

(E) $xy + 15x = \_\_\_\_(y + 15)$

(A) $bu + uv = \_\_\_\_(b+v)$

(F) $\frac{2}{5}m + \frac{2}{5}n = \frac{2}{5}(\_\_\_\_ + n)$

(M) $\frac{3}{4}a + \frac{3}{4}b + \frac{3}{4}c = \_\_\_\_(a+b+c)$

(S) $7ax + 2ay = a(7x + \_\_\_\_)$

(T) $4kx + 11ky = \_\_\_\_(4x + 11y)$

(R) $3ay + 8by = y(\_\_\_\_ + 8b)$

Answers:

(16) 4

(5) u

(22) a

(11) x

(21) $2y$

(13) y

(19) $3a$

(2) 3

(12) m

(15) k

(8) $\frac{3}{4}$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

What Happened to Ray Floob After He Fell Off the Empire State Building?

Simplify each expression below. Circle the letter of each answer. Then rearrange the circled letters in each section to make a word. Write the words in order in the boxes at the bottom of the page. You will find the answer to the title question.

(1) $3x + 2(5x - 7)$ (2) $9 - 3(2x - 4)$ (3) $8x - 6(3 - 2x)$ (4) $-5 + 5(x + 4)$	S $20x - 3$ E $13x - 14$ T $5x + 15$	Y $20x - 18$ N $5x + 11$ H $-6x + 21$
(5) $4(6n + 9) - 10n$ (6) $14 - 3(4n - 1)$ (7) $-8n - 8(-4 - 2n)$	O $14n + 36$ E $-12n + 13$ W $8n + 32$	S $19n + 36$ N $-12n + 17$ T $8n - 1$
(8) $7k - 2(3k + 1) - 9$ (9) $-6 + 5(8 - k) - 8k$ (10) $k + 1 - 4(2k - 9)$ (11) $-10k - 3 + 2(5 + 6k)$	L $2k + 7$ A $-7k + 37$ K $2k - 4$	C $-13k + 34$ I $-7k + 30$ L $k - 11$
(12) $8 + 9x + 4(11 - 2x)$ (13) $-4(-2x - 7) + 6x - 7$ (14) $9 - 3(-4 + 3x) + 12x$	A $14x + 30$ H $3x + 21$ T $3x + 6$	R $6x + 52$ M $x + 52$ I $14x + 21$
(15) $5(2y - 4) + 2(y + 9)$	A $12y - 4$	X $12y - 2$
(16) $-4(3u - 1) + 7(3 - 2u)$ (17) $6(-5u + 1) - 3(4u - 12)$ (18) $3(-u - 5) + 8(2u + 1)$	W $-42u + 9$ S $13u - 12$ R $13u - 7$	Y $-42u + 42$ D $-5u + 25$ A $-26u + 25$

BOOKS NEVER WRITTEN

The Break-in by

___	___	___	___	___	___	___	___	___	___
10	−13	−7	−7	−25	8	72	6	5	−4

Origin of Man by

___	___	___	___	___	___	___	___	___
−1	−11	−2	72	17	−6	25	17	12

Making Soap by

___	___	___	___	___	___	___	___	___
−9	25	−13	72	−8	25	−2	12	−6

ABOVE ARE THE TITLES OF THREE "BOOKS NEVER WRITTEN."
TO DECODE THE NAMES OF THEIR AUTHORS:

Solve each equation below and find your solution in the code. Each time the solution appears, write the letter of that exercise above it.

(O) $4y - 9 = 15$

(A) $6x + 7 = -5$

(S) $-9t + 2 = 56$

(P) $-69 = 7v - 6$

(Y) $35 = -2x - 15$

(I) $4 - 3n = 43$

(N) $12 - 5u = -48$

(C) $-27 + 20w = 73$

(E) $13 = 5 - 8m$

(K) $11r + 60 = 16$

(U) $y - 24 = -7$

(J) $23 - x = 13$

(V) $-67 = 6x - 1$

(M) $-4e - 9 = 19$

(D) $-8 = 32 - 5q$

(H) $6 + 10k = 256$

(T) $-100 = 12t - 4$

(L) $36 - x = -36$

OBJECTIVE 4–g: To solve equations of the form $ax + b = c$, where a is an integer (solutions are integers).

CRYPTIC QUIZ

1. Why does Beethoven now spend all his time erasing music?

16	6	−4	10	−3	6	−9	7	20	−5	7	10	−4	3	21

2. What is it called when a sea bird lands on a channel marker?

−36	9	7	−8	20	6	6	−2	10	21	9	11	11

3. How does a tree feel after a hard day at work?

−36	9	10	16	6	−3

TO DECODE THE ANSWERS TO THESE QUESTIONS:

Solve each equation below and find your answer in the code. Each time the solution appears, write the letter of that exercise above it.

(O) $8u = 3u + 35$

(N) $7y = 33 - 4y$

(E) $2x + 48 = 10x$

(T) $5t - 26 = 18t$

(I) $k = 8k + 28$

(G) $-30n = -27n - 63$

(H) $4x + 4 = 2x + 36$

(D) $9y - 1 = y - 25$

(P) $14p - 8 = 22 + 20p$

(L) $z + 81 = 9z - 7$

(Y) $39 - 12w = 7 - 16w$

(C) $-15v - 40 = 23 - 8v$

(M) $63 - x = 2x + 3$

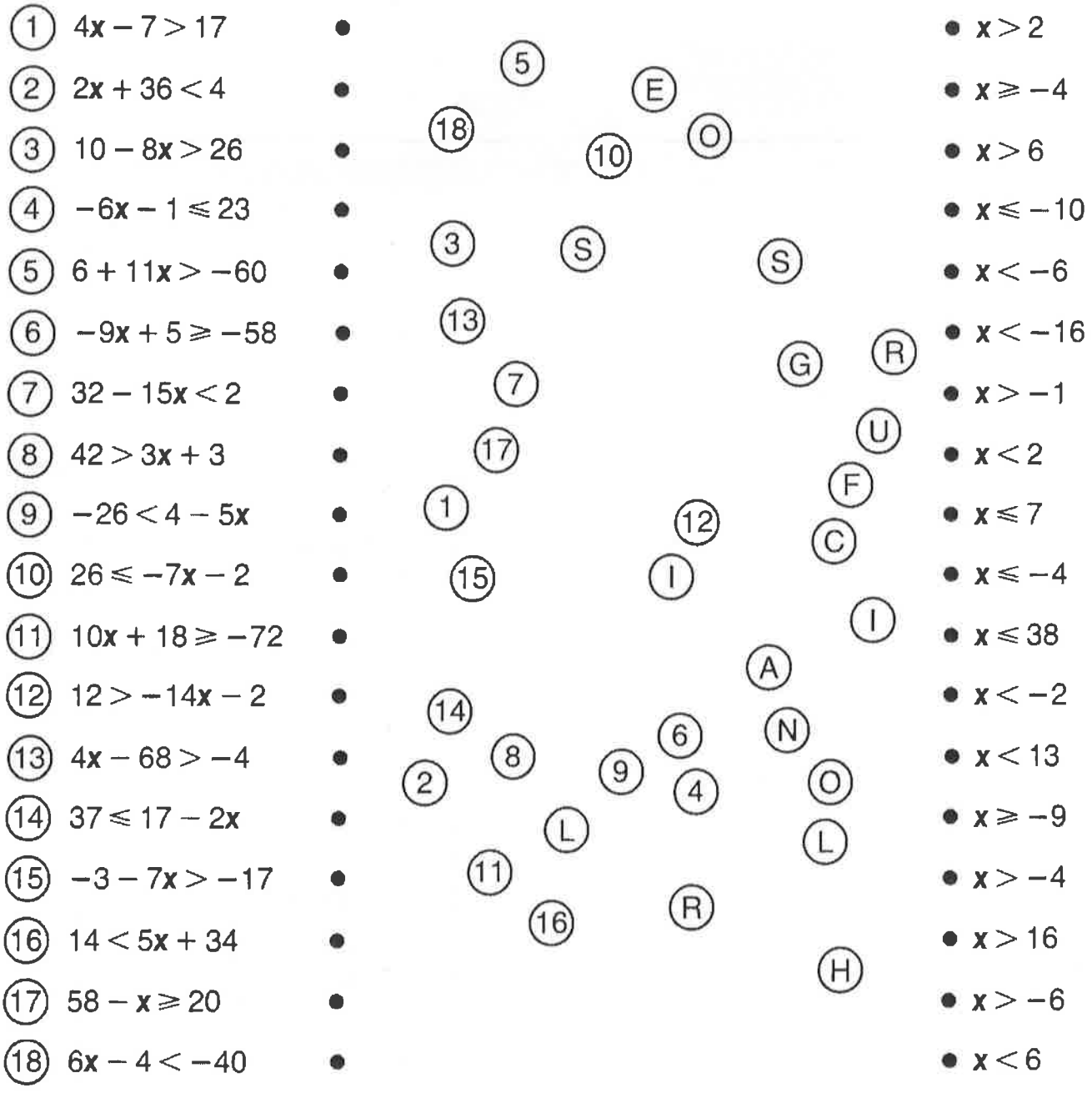
(U) $3n + 46 = 1 + 8n$

(B) $12r - 18 = 13r + 18$

(S) $-x - 1 = x - 21$

In Music, What Does "Allegro" Mean?

Solve each inequality below. Draw a straight line connecting it to the inequality that describes the solution set. The line will cross a number and a letter. Write the letter in the matching numbered box at the bottom of the page.

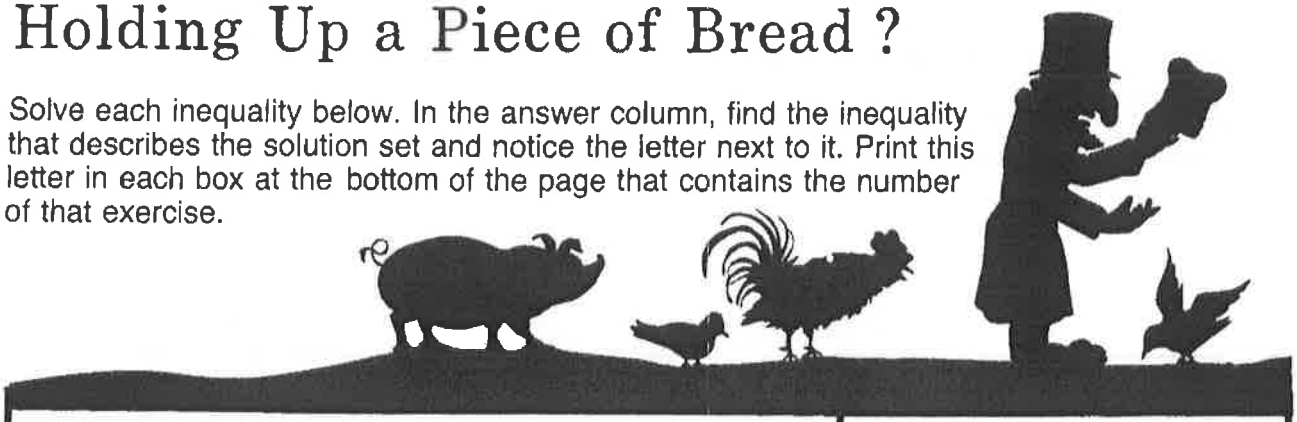


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

OBJECTIVE 2–b: To solve inequalities of the form $ax + b > c$, where a is an integer.

Why Was Professor Clabberhead Utterbunk Holding Up a Piece of Bread ?

Solve each inequality below. In the answer column, find the inequality that describes the solution set and notice the letter next to it. Print this letter in each box at the bottom of the page that contains the number of that exercise.



(1) $5x + 2 > 3x + 10$

(2) $8 + 2x \leq 6x - 20$

(3) $4x + 49 < 9 - x$

(4) $9x - 99 \geq 18x$

(5) $3(x - 4) > 15$

(6) $28 < 4(5 - 2x)$

(7) $3(2n + 1) \geq 4n + 9$

(8) $3n - 10 \leq 7(2 + n)$

(9) $-4(2n - 6) < n + 6$

(10) $2(7n - 1) \geq 3(5 - n)$

(11) $7n - 2(n + 5) < 3n - 16$

(12) $4(1 - 3n) - 14 > 4(2n + 3) - 9n$

(L) $n \geq 5$

(G) $n \geq -6$

(A) $x < -8$

(O) $n < -3$

(R) $x > 4$

(S) $x < -1$

(U) $x < 10$

(I) $x \leq -11$

(P) $n \geq 1$

(N) $x \geq 7$

(T) $n < -2$

(E) $n \geq 3$

(W) $n > 2$

(M) $n < -5$

(H) $x > 9$

5	7	9	3	6	10	1	11	10	11	6	4	2	8	3	12	11	3	6	12

OBJECTIVE 2–d: To solve inequalities containing parentheses and/or having the variable in both sides.

Chapter 6 Solutions

Page 5

A. 7b
R. 4x
Y. 27
S. 24x
O. 4a
E. xy
I. 8y
D. 30x
W. ax
E. 2ay
T. 5
R. 6y
O. y
T. a
W. 4
H. 3
E. x
A. u
F. m
M. 3/4
S. 2y
T. k
R. 3a

THEY ARE MADE FOR TWO WRISTS

They are made for two wrists (tourists).

Page 24

1. E
2. H
3. Y
4. T
5. O
6. N
7. W
8. L
9. C
10. A
11. L
12. M
13. I
14. H
15. X
16. A
17. Y
18. R

THEY NOW CALL HIM X RAY

They now call him x Ray.

Page 34

JIMMY D LOCK
EVA LU SHUN
PHIL T HANS

O. 6
A. -2
S. -6
P. -9
Y. -25
I. -13
N. 12
C. 5
E. -1
K. -4
U. 17
J. 10
V. -11
M. -7
D. 8
H. 25
T. -8
L. 72

Page 41

1. HE IS DECOMPOSING
2. BUOY MEETS GULL
3. BUSHED

O. 7
N. 3
E. 6
T. -2
I. -4
G. 21
H. 16
D. -3
P. -5
L. 11
Y. -8
C. -9
M. 20
U. 9
B. -36
S. 10

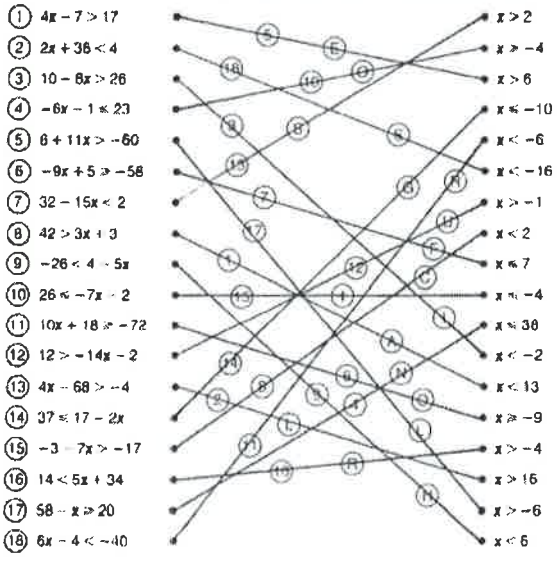
Page 192

1. $x > 4$
2. $x \geq 7$
3. $x < -8$
4. $x \leq -11$
5. $x > 9$
6. $x < -1$
7. $n \geq 3$
8. $n \geq -6$
9. $n > 2$
10. $n \geq 1$
11. $n < -3$
12. $n < -2$

HE WAS PROPOSING A TOAST

In Music, What Does "Allegro" Mean?

Solve each inequality below. Draw a straight line connecting it to the inequality that describes the solution set. The line will cross a number and a letter. Write the letter in the matching numbered box at the bottom of the page.



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	L	I	N	E	O	F	C	H	O	R	U	S	G	I	R	L	S

OBJECTIVE 2 b To solve inequalities of the form $ax + b > c$, where a is an integer

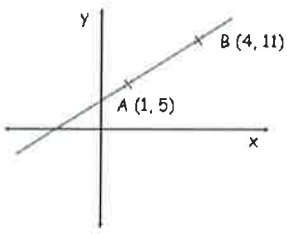
Chapter 7

Phase C winter: Gradient and Straight-Line Revision

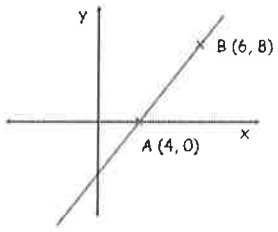
Calculate the gradients of the lines between the points shown

11.

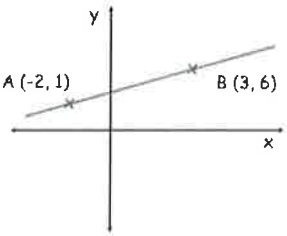
(a)



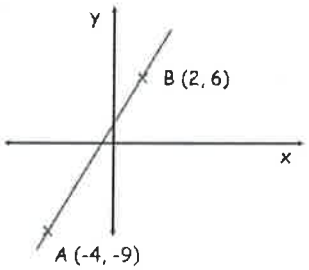
(b)



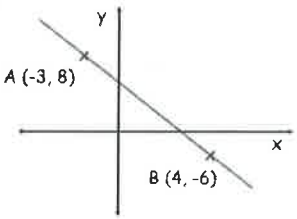
(c)



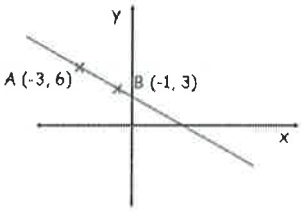
(d)



(e)



(f)

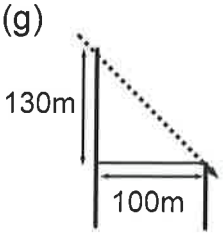


A ski-resort defines its ski-jumps depending on how steep it is. The classifications are as follows :-

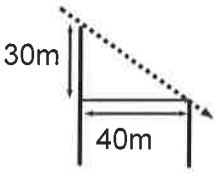
Slope-type	Gradient
Adventurer	≤ 0.8
Hero	More than 0.8 and less than 1.2
Nutcase	≥1.2

Classify each of the following ski-jumps .

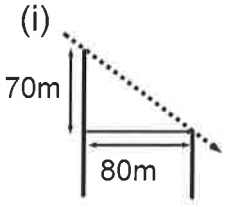
(g)



(h)



(i)



Write down the equation of lines with the following values

(j) Gradient = 7 and y-intercept -3

(k) Gradient = $^1/_2$ and y-intercept 4

(l) Gradient = -3 and y-intercept -6

12.

(a) Rank the following lines in order of steepness from least to most.

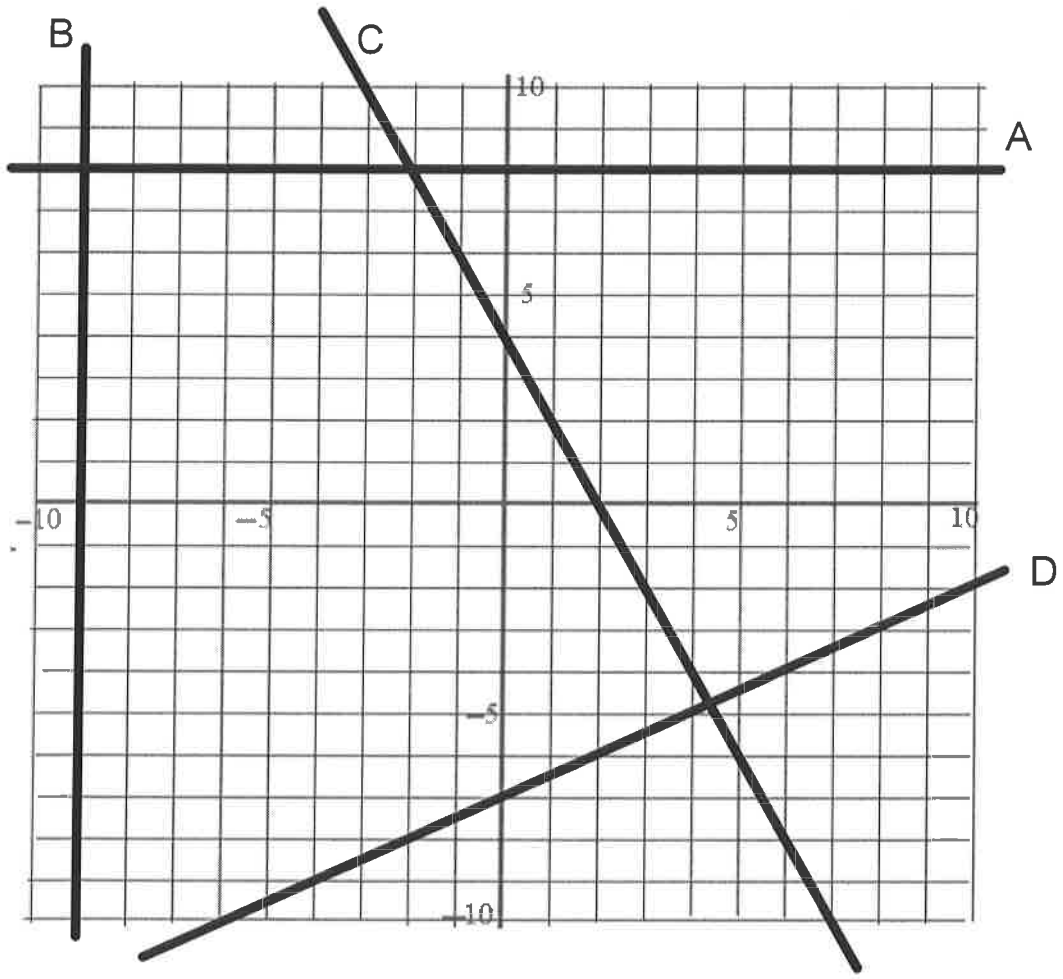
Line A: $y = 7x - 3$

Line B: $y = {}^{1}/_{4}x + 25$

Line C: $y = {}^{3}/_{4}x + 0.1$

(b) Label the 4 lines shown. Choose from the list below

$y = -9$	$y = 2x + 4$	$y = -9x$	$y = 8$
$x = 8$	$x = 8y$	$x = -9y$	$y = -2x + 4$
$y = 4x - 2$	$y = -4x + 2$	$y = -{}^{1}/_{2}x - 7$	$y = -{}^{1}/_{2}x + 4$
$x = -9$	$y = 8x$	$y = {}^{1}/_{2}x + 7$	$y = {}^{1}/_{2}x - 7$



Answers

11 (a) 2 (b) 4 (c) 1

(d) $2\frac{1}{2}$ (e) -2 (f) $-1\frac{1}{2}$

(g) Gradient = 1.3 so it is a "nutcase" slope

(h) Gradient = 0.75 so it is an "adventurer" slope

(i) Gradient = 0.875 so it is a "hero" slope

(j) $y = 7x - 3$

(k) $y = {}^1/_2x + 4$

(l) $y = -3x - 6$

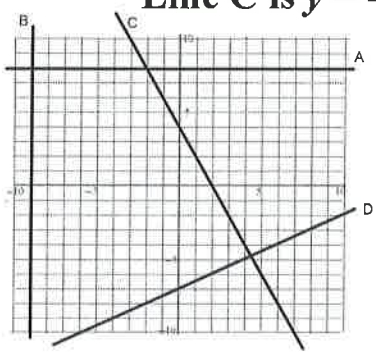
12 (a) *Line B:* $y = {}^1/_4x + 25$ Gradient = 0.25

Line C: $y = {}^3/_4x + 0.1$ Gradient = 0.75

Line A: $y = 7x - 3$ Gradient = 7

(b) **Line C is $y = -2x + 4$**

Line B is $x = -9$



Line A is $y = 8$

Line D is $y = {}^1/_2x - 7$