Year 8 Half Yearly Revision

Financial Maths – Fractions, Decimals and Percentages and Algebra review and Equations

Financial Maths – Fractions, Decimals and Percentages

Check your skills

1 Express 0.08% as a decimal.
A 0.0008 **B** 0.008 **C** 0.08 **D** 0.8

2 Express $5\frac{5}{6}$ as a percentage.
A 58.3 **B** 5.83 **C** 58.33 **D** 583.3

3 Express 82 L as a percentage of 90 L.
A 0.91% **B** 9.1% **C** 91.1% **D** 911.1%

4 Express 32 min as a percentage of $1\frac{1}{4}$ h.
A 0.426% **B** 4.26% **C** 42.6% **D** 426.6%

5 Find $52\frac{1}{2}$% of $7500.
A $3937.50 **B** $3562.50 **C** $3973.50 **D** $3937.50

6 Increase 620 kg by 12%.
A 74.4 kg **B** 545.6 kg **C** 694.4 kg **D** 644.4 kg

7 Decrease $230 by 56%.
A $358.80 **B** $101.20 **C** $149.50 **D** $105.80

8 Calculate the percentage increase from 36 kg to 65 kg to the nearest per cent.
A 55% **B** 80% **C** 45% **D** 81%

9 What is 100% of a quantity if 27% is 189?
A 1.89 **B** 7 **C** 51.03 **D** 700

10 The original price of a laptop is increased by 35% to $1146.15. What was the original price?
A $3274.71 **B** $1146.15 **C** $849 **D** $401.15

11 If 65% of a quantity is 572 what is 42% of the quantity?
A $371.80 **B** $369.60 **C** $240.24 **D** $156.16

12 Brendan and Tiarne purchased a house in 2007 for $430 000. They sold it in 2013 for $572 000. Express the profit as a percentage of the purchase price.
A 33% **B** 25% **C** 30% **D** 75%

13 A car with cost price of $6000 is sold at a loss of 45%. What is the selling price?
A $2700 **B** $3300 **C** $8700 **D** $9300

14 A ring is sold for $840. This is a profit of 40%. What was the cost price of the ring?
A $2100 **B** $504 **C** $600 **D** $336

15 An item valued at $675 needs to have 10% GST added. What is the selling price inclusive of GST?

A $607.50 **B** $668.25 **C** $742.50 **D** $67.50

16 A watch is advertised at $199 including GST. What was the pre-GST cost of the watch?

A $19.90 **B** $179.10 **C** $18.09 **D** 180.91

7A Review set

1 Find 15% of 200 kg.

2 Express 26 kg as a percentage of 78 kg, correct to 2 decimal places.

3 Increase 100 by 40%.

4 Decrease 280 by 25%.

5 The amount of water in a tank increases from 80 L to 135 L. What is the percentage increase?

6 Find the percentage decrease from 85 kg to 68 kg.

7 Find 100% of a quantity if 37% is $155.40.

8 The price of a bicycle is increased by 60% to $638.40. Calculate the original price.

9 An antique gun purchased for $1200 was later sold for $2900.

a Calculate the profit.

b Express the profit as a percentage of the cost price.

10 A necklace with a cost price of $149 is sold at a loss of 12%. Calculate the selling price.

11 A skateboard was sold for $76.50. This was a loss of 15%. Calculate the cost price.

12 A microwave oven is listed at $189 including GST.

a Calculate the GST.

b Calculate the pre-GST price.

7B Review set

1 Robyn scored 73 out of 100 in a Science exam. Express her result as a percentage.

2 Write 55 g as a percentage of 250 g.

3 Write \$0.24 as a percentage of \$2.40.

4 Find 53% of \$400.

5 Find $5\frac{1}{4}$% of 200 kg.

6 Daniel earns \$720 per week. He spends 46% of his income on rent and household expenditure, 22% on entertainment and the remainder is placed in a savings account. Calculate the amount of money Daniel allocates each week to:

a rent and household expenditure **b** entertainment **c** savings

7 Express 45 cm as a percentage of 1.2 m.

8 Decrease 14 m by 8%.

9 Joe purchases bananas for 20c each. If he sells them at an increased price of 160%, what is the selling price of a banana?

10 Find 100% of a quantity if 62% is \$264.12.

11 A tennis racquet was sold for \$135. This was a profit of 43%. Calculate the cost price.

12 Calculate the GST on a DVD player listed at \$89 excluding GST.

7C Review set

1 Express 4.2 kg as a percentage of 800 g.

2 Express 64 L as a percentage of 80 L.

3 Find 42% of 5000 km.

4 Increase 84 m by 6%.

5 Find the percentage decrease from 135 L to 61 L.

6 Find 100% of a quantity if 135% is \$75.60.

7 The price of a concert ticket is increased by 140% to \$124.60. Calculate the original price.

8 A signed West Tigers jumper purchased for \$800 was sold for \$2000.

a Calculate the profit.

b Express the profit as a percentage of the cost price.

9 An Eels jumper was sold for $35. This was a loss of 76%. Calculate the cost price.

10 Craig purchased a mountain bike for $1800. He later sold it for $1332. Express the loss as a percentage of the cost price.

11 Calculate the GST on a dinner set listed at $385 excluding GST.

12 Calculate the pre-GST price of a tracksuit listed at $99 including GST.

7D Review set

1 Express 4.5 m as a percentage of 120 cm.

2 Express 660 g as a percentage of 1.2 kg.

3 Find 72% of $80.

4 Decrease $6500 by 28%.

5 Over a period of time the value of a house increased by 15% to $564 000. Find the original value of the house, to the nearest dollar.

6 Calculate the percentage increase from 48 kg to 91 kg.

7 Calculate the percentage decrease from 112 m to 78 m.

8 Find 100% of a quantity if 38% is 29.64 kg.

9 A brochure advertises jackets for 30% off the original price. Calculate the original cost if the sale price is $455.

10 The price of a concert ticket is increased by 74% to $374.10. Calculate the original price.

11 A radio-controlled plane with a cost price of $349 is sold at a loss of 23%. Calculate the selling price.

12 A collector card was sold for $475. This was a profit of 35%. Calculate the cost price.

13 Find the GST on an item marked at $1980 including 10% GST.

14 Calculate the selling price of an item valued at $95 if 10% GST must be added.

Check your skills

1 A	2 D	3 C	4 C	5 A
6 C	7 B	8 D	9 D	10 C
11 B	12 A	13 B	14 C	15 C
16 D				

Review set 7A

1 30 kg
2 33.33%
3 140
4 210
5 68.75%
6 20%
7 $420
8 $399
9 a $1700
b 141.7%
10 $131.12
11 $90
12 a $17.18
b $171.82

Review set 7B

1 73%
2 22%
3 10%
4 $212
5 10.5 kg
6 a $331.20
b $158.40
c $230.40
7 37.5%
8 12.88 m
9 32c
10 $426
11 $94.41
12 $8.90

Review set 7C

1 525%
2 80%
3 2100 km
4 89.04 m
5 54.8%
6 $56
7 $89
8 a $1200
b 150%
9 $145.83
10 26%
11 $38.50
12 $90

Review set 7D

1 375%
2 55%
3 $57.60
4 $4680
5 $490 434.78, so $490 435
6 89.6%
7 30.4%
8 78 kg
9 $650
10 $215
11 $268.73
12 $351.85
13 $180
14 $104.50

Check your skills

1 Name the denominator in $16\frac{4}{9}$.

A 1 **B** 16 **C** 4 **D** 9

2 How many fifths in 25?

A 5 **B** 25 **C** 100 **D** 125

3 Express $\frac{47}{3}$ as a mixed numeral.

A $15\frac{2}{3}$ **B** $15\frac{1}{3}$ **C** $16\frac{1}{3}$ **D** $16\frac{2}{3}$

4 Express $12\frac{1}{4}$ as an improper fraction.

A $\frac{17}{4}$ **B** $\frac{49}{4}$ **C** $\frac{37}{4}$ **D** $\frac{46}{4}$

5 What sign could be inserted to make the following true: $\frac{31}{3}$ ____ 11?

A = **B** < **C** > **D** ×

5 What sign could be inserted to make the following true: $\frac{31}{3}$ ____ 11?

A = **B** < **C** > **D** ×

6 Which of the following is equivalent to $\frac{4}{9}$?

A $\frac{12}{28}$ **B** $\frac{28}{64}$ **C** $\frac{20}{45}$ **D** $\frac{12}{36}$

7 Which of the following is equivalent to $\frac{3}{7}$?

A $\frac{21}{28}$ **B** $\frac{18}{42}$ **C** $\frac{9}{20}$ **D** $\frac{12}{29}$

8 Which of the following *cannot* be simplified to $\frac{4}{5}$?

A $\frac{32}{40}$ **B** $\frac{60}{75}$ **C** $\frac{88}{110}$ **D** $\frac{200}{245}$

9 Which fraction when simplified is $\frac{9}{11}$?

A $\frac{54}{66}$ B $\frac{35}{44}$ C $\frac{90}{101}$ D $\frac{18}{20}$

10 Express \$20 as a fraction of \$64, in simplest form.

A $\frac{5}{16}$ B $\frac{10}{32}$ C $\frac{4}{16}$ D $\frac{2}{9}$

11 Express 350 g as a fraction of 1.8 kg, in simplest form.

A $194\frac{2}{5}$ B $1\frac{17}{18}$ C $\frac{36}{7}$ D $\frac{7}{36}$

12 Simplify $\frac{11}{13} + \frac{9}{13}$.

A $\frac{20}{13}$ B $\frac{2}{13}$ C $1\frac{7}{13}$ D $\frac{99}{13}$

13 Simplify $10\frac{4}{5} - 8\frac{2}{3}$.

A $2\frac{6}{15}$ B $2\frac{2}{15}$ C $2\frac{8}{15}$ D $2\frac{4}{5}$

14 Simplify $\frac{4}{9} \times 6\frac{1}{2}$.

A $24\frac{1}{3}$ B $2\frac{8}{9}$ C $\frac{52}{54}$ D $36\frac{9}{12}$

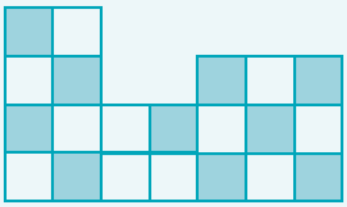
15 Simplify $8\frac{1}{4} \div 3\frac{1}{3}$.

A $3\frac{4}{12}$ B $2\frac{13}{40}$ C $2\frac{7}{12}$ D $2\frac{19}{40}$

5A Review set

1 What fraction of this diagram is:

a shaded? b unshaded?



2 If $\frac{5}{13}$ of a diagram is shaded, what fraction is unshaded?

3 Convert $\frac{47}{9}$ to a mixed numeral.

4 Convert $8\frac{4}{7}$ to an improper fraction.

5 Complete $\frac{7}{12} = \frac{49}{\square}$.

6 Arrange in ascending order: $\frac{7}{10}, \frac{4}{5}, \frac{9}{20}$.

7 State the reciprocal of $\frac{5}{8}$.

8 Simplify the following.

a $\frac{4}{5} + \frac{1}{3}$ **b** $\frac{11}{12} - \frac{1}{3}$ **c** $\frac{3}{7} \times \frac{1}{4}$ **d** $\frac{5}{6} \div \frac{1}{4}$

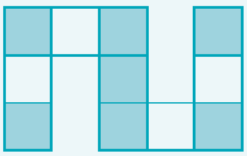
9 Simplify $\frac{1}{2} \times \frac{2}{3} + \frac{1}{4}$.

10 Sue-Lin donated $\frac{2}{11}$ of her weekly income to charity. If her income is $495 per week, how much did she donate?

5B Review set

1 What fraction of this diagram is:

a shaded? **b** unshaded?



2 If Maria ate $\frac{4}{9}$ of a chocolate cake, what fraction would remain?

3 Convert $\frac{108}{7}$ to a mixed numeral.

4 Convert $5\frac{2}{9}$ to an improper fraction.

5 Complete $\frac{80}{100} = \frac{\square}{5}$.

6 Arrange in descending order: $\frac{3}{8}, \frac{2}{3}, \frac{7}{12}$.

7 State the reciprocal of $5\frac{1}{2}$.

8 Simplify the following.

a $2\frac{1}{2} + 6\frac{3}{5}$ **b** $12\frac{1}{3} - 4\frac{1}{4}$

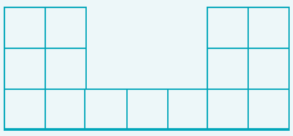
9 Simplify the following.

a $3\frac{4}{5} \times 2\frac{1}{2}$ **b** $8\frac{1}{3} \div 2\frac{1}{6}$

10 Simplify $15\frac{3}{5} \div 2\frac{2}{3} - 3\frac{1}{4}$.

5C Review set

1 Copy the diagram and shade $\frac{1}{3}$.



2 Jennifer inherited $\frac{5}{12}$ of her grandfather's estate and Pauline inherited the remainder. What fraction of the estate did Pauline inherit?

3 Convert $\frac{58}{19}$ to a mixed numeral.

4 Convert $12\frac{3}{4}$ to an improper fraction.

5 Complete $\frac{75}{120} = \frac{\square}{8}$.

6 Simplify $\frac{48}{72}$.

7 Arrange in ascending order: $\frac{1}{2}, \frac{2}{3}, \frac{1}{6}$.

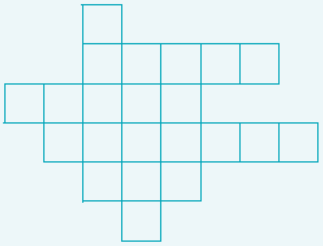
8 State the reciprocal of $8\frac{5}{7}$.

9 Simplify $20\frac{1}{2} \div 5\frac{1}{4} + 6\frac{1}{3}$.

10 A bowl contains $7\frac{3}{4}$ L of punch. After 3 hours, $\frac{3}{4}$ of the punch has been drunk. How many litres are left?

5D Review set

1 Copy the diagram and shade $\frac{6}{11}$.



2 In a class of 30 students, $\frac{1}{3}$ play soccer, $\frac{1}{5}$ play netball and the remainder play football. What fraction of the class plays football?

3 Convert $\frac{146}{13}$ to a mixed numeral.

4 Convert $20\frac{4}{5}$ to an improper fraction.

5 Complete $\frac{155}{\square} = \frac{31}{40}$.

6 Simplify $\frac{185}{240}$.

7 Arrange in descending order: $\frac{3}{5}, \frac{8}{15}, \frac{2}{3}$.

8 State the reciprocal of $5\frac{1}{6}$.

9 Calculate $\frac{5}{8}$ of 592 kg.

10 Liam earns \$870 per week. He banks $\frac{1}{5}$, spends $\frac{2}{3}$ on rent and food, and puts the remaining money to personal use.

a How much does Liam bank each week?

b How much does he spend weekly on rent and food?

c What fraction of Liam's weekly wage is for personal use?

d How much does he spend weekly on personal use?

Check your skills

1 D	2 D	3 A	4 B	5 B
6 C	7 B	8 D	9 A	10 A
11 D	12 C	13 B	14 B	15 D

Review set 5A

1 a $\frac{10}{21}$ b $\frac{11}{21}$

2 $\frac{8}{13}$ 3 $5\frac{2}{9}$

4 $\frac{60}{7}$ 5 $\frac{49}{84}$

6 $\frac{9}{20}, \frac{7}{10}, \frac{4}{5}$ 7 $\frac{8}{5}$

8 a $1\frac{2}{15}$ b $\frac{7}{12}$ c $\frac{3}{28}$ d $3\frac{1}{3}$

9 $\frac{7}{12}$ 10 \$90

Review set 5B

1 a $\frac{7}{11}$ b $\frac{4}{11}$

2 $\frac{5}{9}$ 3 $15\frac{3}{7}$

4 $\frac{47}{9}$ 5 $\frac{4}{5}$

6 $\frac{2}{3}, \frac{7}{12}, \frac{3}{8}$ 7 $\frac{2}{11}$

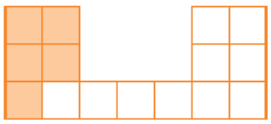
8 a $9\frac{1}{10}$ b $8\frac{1}{12}$

9 a $9\frac{1}{2}$ b $3\frac{11}{13}$

10 $2\frac{3}{5}$

Review set 5C

1 Shade any 5 squares.



2 $\frac{7}{12}$

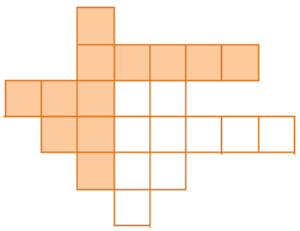
3 $3\frac{1}{19}$ 4 $\frac{51}{4}$

5 $\frac{5}{8}$ 6 $\frac{2}{3}$ 7 $\frac{1}{6}, \frac{1}{2}, \frac{2}{3}$

8 $\frac{7}{61}$ 9 $10\frac{5}{21}$ 10 $1\frac{15}{16}$ L

Review set 5D

1 Shade any 12 squares.



2 $\frac{7}{15}$ 3 $11\frac{3}{13}$

4 $\frac{104}{5}$ 5 $\frac{155}{200}$

6 $\frac{37}{48}$ 7 $\frac{2}{3}, \frac{3}{5}, \frac{8}{15}$

8 $\frac{6}{31}$ 9 370 kg

10 a \$174 b \$580 c $\frac{2}{15}$ d \$116

Percentage Problems

1 Mohammed achieved 54 correct answers out of 60 in his driving knowledge test. What percentage was this?

2 A soccer team won 72% of 75 games played. How many games did they win?

3 Brown's store offers 15% discount while Wong's store offers $\frac{1}{6}$ discount. Whose store offers the better discount?

4 In a national survey of 12 270 citizens, 39% wanted a new Australian flag. How many people was this?

5 Increasing an amount by 5% is equivalent to multiplying that amount by 105%. What percentage is equivalent to:

a an increase of 12%? **b** a decrease of 16%? **c** a decrease of 9%?

6 Last year, 6 420 510 Australians owned a smartphone but this year the figure increased by 9%. What is the new figure?

7 Kayla spent $730 on her credit card and had to pay 13.49% interest. How much interest was this?

8 In a survey of 7400 people, 2812 of them approved of stricter gun laws. What percentage was this?

9 Will pays 28% of his weekly income in tax. If he earns $844 per week, find his weekly tax.

10 The value of Steve's car depreciated by 18% this year. If its value last year was $21 065, what is its value now?

11 At Westvale High, 48 of the 75 teachers are women. What percentage of the teachers are *men*?

12 There are 204 students in Year 8. If 88% of them went on a school camp:

a how many students went? **b** what percentage stayed home?

13 In one year, Australia's population of 22 450 200 increased by 1.1%. What was the new population?

14 At the office, 17% of the 82 employees smoke. How many people smoke?

15 What is the price of an e-reader marked at $109 after GST of 12% is added?

16 In Canada, a $172 camera attracts GST of $12.04. What is the percentage rate of GST?

17 So far, Nala has saved $3085 towards a holiday trip and this is 62% of the full amount. What is the full amount for the trip? Answer correct to the nearest dollar.

18 Last weekend, 8400 drivers were random breath tested for drink driving.

a If 105 drivers were charged, what percentage of the total tested were charged?

b If 16% of the charged drivers were women, how many *men* were charged?

19 Calculate the sale price of a scooter marked at $89 after a 15% discount is given.

20 The most popular Australian pet is the bird, making up 34% of all pets. If there are 20 470 100 pets in Australia, how many are birds?

21 A discount of $50.40 was given on a car stereo with a marked price of $280.

a Find the discount price.

b Calculate the discount as a percentage of the marked price.

22 Natasha earns 2.8% commission on all property she sells. How much did she earn for selling an apartment for $285 750?

23 Emad's salary of $80 200 received an increase of 4.6% this year. Calculate his new salary.

24 In a music survey of 1400 people, 22% preferred country music.

a What percentage didn't prefer country music?

b How many people didn't prefer country music?

25 J-Mart are having a '12% off' sale. How much should Nicky pay for a tennis racquet marked at $74?

26 In a survey, 430 people wanted Australia to become a republic, 870 people wanted Australia to remain a monarchy, while 100 were undecided. What percentage (to one decimal place) of the group wanted a republic?

Answers

1 90%
2 54
3 Wong's ($16\frac{2}{3}$%)
4 4785
5 **a** 112% **b** 84% **c** 91%
6 6 998 356
7 $98.48
8 38%
9 $236.32
10 $17 273.30
11 36%
12 **a** About 180 students **b** 12%
13 22 697 152
14 14 people
15 $122.08
16 7%
17 $4976
18 **a** 1.25% **b** 88
19 $75.65
20 6 959 834
21 **a** $229.60 **b** 18%
22 $8001
23 $83 889.20
24 **a** 78% **b** 1092
25 $65.12
26 30.7%

Profit and Loss

Round percentage answers to one decimal place if needed.

1 Apples are bought by a fruit shop for 25c each and resold at 33c each.

a What is the cost price? _____

b What is the selling price? _____

c What is the profit? _____

d Calculate the percentage profit on the cost price. _____

2 Josephine makes school uniforms. It costs her $30 to make a girl's winter skirt. She then sells them for $48 each.

a What is the cost price? _____

b What is the selling price? _____

c What is the profit? _____

d Calculate the percentage profit on the cost price. _____

3 Vince bought a tablet device for $429. Six months later, he upgrades and sells it to his sister for $350. Calculate:

a the cost price _____

b the loss _____

c the percentage loss on the cost price. _____

4 Talia buys jumpers at $28 and sells them at her clothes store for $42.

a What is the selling price? _____

b What is the cost price? _____

c Does Talia make a profit or a loss? _____

d Calculate the percentage profit or loss on the cost price. _____

5 Jayden bought a skateboard for $85 and sold it for $55.

a Did he make a profit or loss? _____

b What is the cost price? _____

c Calculate his percentage profit or loss on the cost price. _____

6 Ahmed bought a used car for $14 500, spent another $2000 on repairs, before selling it for $19 000. Find

a the total amount Ahmed spent on the car _____

b the profit he made _____

c the percentage profit on the total amount he spent. _____

7 Alexandra paid $2800 for a home gym and sold it a year later for $2300. Calculate:

a the loss _____

b the percentage loss on the cost price. _____

8 A sports warehouse paid $6500 for 100 pairs of joggers and sold them for $110 a pair. Find:

a the cost price of each pair _____

b the profit made per pair _____

c the percentage profit. _____

Answers

1	**a** 25c	**b** 33c	**c** 8c	**d** 32%
2	**a** \$30	**b** \$48	**c** \$18	**d** 60%
3	**a** \$429	**b** \$79	**c** 18.4%	
4	**a** \$42	**b** \$28	**c** Profit	**d** 50%
5	**a** Loss	**b** \$85	**c** 35.3%	
6	**a** \$16 500	**b** \$2500	**c** 15.2%	
7	**a** \$500	**b** 17.9%		
8	**a** \$65	**b** \$45	**c** 69.2%	

Unitary Method

1 Find the whole amount if:

a 42% is 378 **b** $\frac{5}{9}$ is \$135 **c** 27% is \$145.50

d 0.15 is \$27.90 **e** $\frac{4}{11}$ is \$25 **f** 35% is 140

2 Mai pays 27% of her wage in tax. Find her whole wage if she pays \$248.40.

3 Aaron shares a house and pays $\frac{4}{9}$ of the rent money. What is the total rent if Aaron's share is \$144?

4 At the school, 361 students speak a second language, representing 38% of the student population. How many students attend that school?

5 Each week, Melanie saves \$16, which is 0.4 of her pocket money. What is her pocket money?

6 A drink contains 504 mL, or 28%, of pure orange juice. Calculate the volume of the whole drink in litres.

7 In an opinion poll, 1950 people wanted a new Australian flag. If this represents $\frac{5}{8}$ of the population, how many people were surveyed?

8 After a 9% discount, Adam paid \$213.85 for a mountain bike.

a What was the original price of the bike?

b How much did Adam save?

9 Monique paid \$32.20 interest on her credit card. If the interest rate was 14%, how much did she spend on the card?

10 Dinesh weighs 74.25 kg, which is $\frac{11}{12}$ of his weight last year. What was his weight last year?

11 A used car was re-sold with a profit of \$764, which represents 8% of its cost price. Calculate:

a the cost price

b the selling price

12 A real estate agent earns 3% commission on each property she sells. Calculate the price of a house if the agent earns \$10 356 from its sale.

13 After receiving a 7% pay rise, Derek now earns \$1049.67. What was his old wage?

14 At the '15% off' sale, Kelly paid $36.38 for a volleyball. What was its original price?

15 Angela answered $\frac{3}{5}$ of the questions in her driving test correctly. How many questions were in the test if she answered 36 correctly?

16 The value of Brett's house increased by 11% to $370 962.

a What was its old value?

b By what amount did it increase?

17 Prize money is divided among three sisters so that the eldest gets $\frac{3}{8}$ and the youngest gets $\frac{1}{4}$. If the eldest sister's share is $171, what is the total prize money and the other two sisters' shares?

18 The ratio of cordial to water in a drink is 2 : 7. If 280 mL of water is used:

a how much cordial needs to be added?

b what is the total volume of the drink?

19 A 1900 phone call costs 22 cents for every 25 seconds. How long does a 3-minute call cost?

20 A car travels 342 km on 30 litres of petrol. How far can it travel on 40 litres?

Answers

1 **a** $900 **b** $243 **c** $1650 **d** $186 **e** $68.75 **f** $400
2 $920
3 $324
4 950
5 $40
6 1.8 L
7 3120
8 **a** $235 **b** $21.15
9 $230
10 81 kg
11 **a** $9550 **b** $10 314
12 $345 200
13 $981
14 $42.80
15 60
16 **a** $334 200 **b** $36 762
17 Total is $456; $171, $114
18 **a** 80 mL **b** 360 mL
19 $1.58 **20** 456 km **21** 80 **22** 24 min 20 s

Check your skills

1 $4a + 3a =$
A $7aa$ B $43a$ C $7a$ D $7aa$

2 $5k - k =$
A 4 B 5 C $4kk$ D $4k$

3 $3w - 5 + 4w - 1 =$
A $7w - 6$ B $7w - 4$ C $-w - 6$ D $-w - 4$

4 $10p + 15 + 6p - 20 =$
A $16p - 7$ B $16p + 5$ C $16p - 35$ D $16p - 5$

5 $-4x \times -5y =$
A $-20xy$ B $45xy$ C $20xy$ D $9xy$

6 $8 \div 2k =$
A $4k$ B $\frac{4}{k}$ C $\frac{1}{4k}$ D $\frac{k}{4}$

7 $6(3p + 5)$ when expanded is:
A $18p + 5$ B $18p + 30$ C $3p + 30$ D $63p + 65$

8 $3x(2y - 5z)$ when expanded is:
A $6xy - 15xz$ B $3xy - 15xz$ C $6xy - 5xz$ D $5xy - 8xz$

9 $-2(t + 3)$ when expanded is:
A $-2t + 6$ B $-2t + 1$ C $-2t - 3$ D $-2t - 6$

10 The highest common factor of 12 and 24 is:
A 12 B 24 C 4 D 6

11 The highest common factor of $8x$ and $20y$ is:
A $4x$ B $4y$ C 4 D $4xy$

12 When factorised $9p + 12$ is:
A $9(p + 12)$ B $3(3p + 12)$ C $3(3p + 4)$ D $3p(3p + 3)$

13 When factorised $8m - 4n$ is:
A $4m(m - n)$ B $4(2m - n)$ C $4(2m - 4n)$ D $8(m - 4n)$

14 When factorised $8k^2 - 12k$ is:
A $8k(k - 12)$ B $4k(2k - 3)$ C $4k^2(2 - 3k)$ D $4k(2 - 3k)$

15 An algebraic expression for $2y$ less than $7x$ is:
A $5xy$ B 5 C $7x - 2y$ D $2y - 7x$

16 An algebraic expression for 2 more than the product of a and b is:
A $ab + 2$ B $2ab$ C $a + b + 2$ D $2(a + b)$

11A Review set

1 Simplify:

a $4s + 7s$ b $10k - 4k$ c $5w + 3 + 2w + 8$

d $5p - 2q + 3p$ e $7x + 1 - 4x + 7$ f $3a - 2b - 4a + b$

g $4(g + 5) + 3(g - 2)$

2 Simplify:

a $4x \times 5y$ b $-2p \times 7$ c $-3a \times 6b$

3 Simplify:

a $\frac{8h}{2}$ b $\frac{g}{3g}$ c $\frac{12a}{4a}$ d $\frac{14w}{21vw}$ e $\frac{6a}{9ab}$

4 Expand:

a $3(5m + 3)$ b $2a(3a - 4b)$ c $-5(k - 6)$

5 Find the highest common factor of:

a 16 and 18 b $12a$ and $9b$ c $18x$ and $12y$ d $9x$ and $3x^2$

6 Factorise the following.

a $6k + 9$ b $8t - 16$ c $24w + 18v$

d $-4s - 6$ e $5ab + 10a$ f $9p^2 - 12p$

7 Write an algebraic expression for each statement. Simplify where possible.

a the sum of x and 7 b the difference between $6x$ and $2x$

c the product of $2k$ and $3k$ d the quotient of $15t$ and 5

e increase $5m$ by 2 f increase $5m$ by a factor of 2

g decrease $8z$ by $3z$ h 3 less than $10p$

11B Review set

1 Simplify:

a $5q + 4q$ b $9m - 4m$ c $4a + 7 + 2a + 5$

d $7x - 4y + x$ e $6m - 5 - 3m + 9$ f $5w - 3z - 6w + 4z$

g $3(2h + 5) + 2(4h - 3)$

2 Simplify:

a $5k \times 4m$ b $-3d \times 5c$ c $-2m \times -3n$

3 Simplify:

a $\frac{9y}{3}$ b $\frac{a}{5a}$ c $\frac{10x}{5x}$ d $\frac{9ab}{12a}$ e $\frac{10xy}{10y}$

4 Expand:

a $4(5x + 7)$ b $3a(5a - 2b)$ c $-5(2m - 3)$

5 Find the highest common factor of these terms.

a 24 and 18 b $8w$ and $6v$ c $16a$ and $12b$ d $12a$ and $4ab$

6 Factorise the following.

a $8t + 12$ b $10k - 15$ c $18x + 12y$

d $-6t + 9$ e $4b^2 - 3b$ f $10pqr + 15pqt$

7 Write an algebraic expression for each statement. Simplify where possible.

a the total of $3h$ and $6h$ b $2y$ less than $6y$

c $4t$ out of $10t$ d the product of $6x$ and $5y$

e $4q$ more than $11q$ f $2ab$ increased by a factor of 3

g the quotient of $12w$ and $4w$ h the product of x and y decreased by 8

11C Review set

1 Simplify:

a $10h + h$ b $9d - d$ c $8z + 9 + 2z + 3$

d $7p - 3q - 2q$ e $4a - 3 + 3a - 4$ f $x - 3y - 4x + 2y$

g $5(2t + 3) + 4(3t - 7)$

2 Simplify:

a $5r \times 3s$ b $4g \times -3$ c $-4p \times -4q$

3 Simplify:

a $\frac{6y}{2}$ b $\frac{w}{3w}$ c $\frac{10a}{2a}$ d $\frac{12p}{15pq}$ e $\frac{8ab}{12b}$

4 Expand:

a $6(3v - 1)$ b $5x(2x + 3y)$ c $-3(4d - 5e)$

5 Find the highest common factor of:

a 24 and 36 b $21s$ and $24t$ c $28x$ and $35y$ d $9a^2$ and $12a$

6 Factorise the following.

a $12p - 18$ b $15t + 25u$ c $20k - 16m$

d $-5q - 10$ e $18km - 12kn$ f $6a^2b + 15ab^2$

7 Write an algebraic expression for each statement. Simplify where possible.

a the difference between $7xy$ and $2x$ b $5t$ more than $8t$

c increase $4z$ by a factor of $3w$ d $2p$ less than $9p$

e $5ab$ out of $10abc$ f decrease $10pq$ by $6pq$

g the sum of $2a + 3b$ and $a + 5b$ h the product of 3 and $x + y$

11D Review set

1 Simplify:

a $7k + k$ b $9m - 3m$ c $6b + 7e - 4b + 2e$

d $10 - 4t - 2$ e $8a - 4b - 7a + 7b$ f $12x - 5(2x - 3)$

g $5(3w - 7) - 2(4w + 1)$

2 Simplify:

a $7p \times 5$ b $-3a \times 9b$ c $-4x \times 3y \times -5z$

3 Simplify:

a $\frac{8k}{2}$ b $\frac{3a}{a}$ c $\frac{10}{4x}$ d $\frac{-5z}{15wz}$ e $\frac{-12k}{-4kmn}$

4 Expand:

a $6(2a - 3)$ b $-4x(5x + 7)$ c $-3ab(2ab - 7a)$

5 Find the highest common factor of:

a 36 and 48 b $18x$ and $24y$ c $16m$ and $12m$ d $24xy$ and $9x$

6 Factorise the following.

a $9k + 15$ b $12m - 8n$ c $-6t + 9$

d $-10x - 5y$ e $5a^2 - 7a$ f $12abc + 15ac$

7 Write an algebraic expression for each statement. Simplify where possible.

a $3x$ more than the difference between x and 7

b $2k$ less than the sum of $4k$ and 3

c increase $m + n$ by a factor of 3

d p more than the product of $3p$ and 5

e the quotient of $8wz$ and $10w$

f $7n$ less than $3n$

g $9km$ out of $15k^2$

h 25% of y

Check your skills

1 C 2 D 3 A 4 D 5 C
6 B 7 B 8 A 9 D 10 A
11 C 12 C 13 B 14 B 15 C
16 A

Review set 11A

1 a $11s$ b $6k$
c $7w + 11$ d $8p - 2q$
e $3x + 8$ f $-a - b$
g $7g + 14$

2 a $20xy$ b $-14p$
c $-18ab$

3 a $4h$ b $\frac{1}{3}$ c 3 d $\frac{2}{3v}$ e $\frac{2}{3b}$

4 a $15m + 9$ b $6a^2 - 8ab$
c $-5k + 30$

5 a 2 b 3 c 6 d $3x$

6 a $3(2k + 3)$ b $8(t - 2)$
c $6(4w + 3v)$ d $-2(2s + 3)$
e $5a(b + 2)$ f $3p(3p - 4)$

7 a $x + 7$ b $4x$ c $6k^2$ d $3t$
e $5m + 2$ f $10m$ g $5z$ h $10p - 3$

Review set 11B

1 a $9q$ b $5m$
c $6a + 12$ d $8x - 4y$
e $3m + 4$ f $-w + z$
g $14h + 9$

2 a $20\ km$ b $-15cd$ c $6mn$

3 a $3y$ b $\frac{1}{5}$ c 2 d $\frac{3b}{4}$ e x

4 a $20x + 28$ b $15a^2 - 6ab$
c $-10m + 15$

5 a 6 b 2 c 4 d $4a$

6 a $4(2t + 3)$ b $5(2k - 3)$
c $6(3x + 2y)$ d $-3(2t - 3)$
e $b(4b - 3)$ f $5pq(2r + 3t)$

7 a $9h$ b $4y$ c $\frac{2}{5}$ d $30xy$
e $15q$ f $6ab$ g 3 h $xy - 8$

Review set 11C

1 a $11h$ b $8d$
c $10z + 12$ d $7p - 5q$
e $7a - 7$ f $-3x - y$
g $22t - 13$

2 a $15rs$ b $-12g$ c $16pq$

3 a $3y$ b $\frac{1}{3}$ c 5 d $\frac{4}{5q}$ e $\frac{2a}{3}$

4 a $18v - 6$ b $10x^2 + 15xy$
c $-12d + 15e$

5 a 12 b 3 c 7 d $3a$

6 a $6(2p - 3)$ b $5(3t + 5u)$
c $4(5k - 4m)$ d $-5(q + 2)$
e $6k(3m - 2n)$ f $3ab(2a + 5b)$

7 a $7xy - 2x$ b $13t$ c $12wz$ d $7p$
e $\frac{1}{2}c$ f $4pq$ g $3a + 8b$ h $3(x + y)$

Review set 11D

1 a $8k$ b $6m$
c $2b + 9e$ d $8 - 4t$
e $a + 3b$ f $2x + 15$
g $7w - 37$

2 a $35p$ b $-27ab$ c $60xyz$

3 a $4k$ b 3 c $\frac{5}{2x}$ d $-\frac{1}{3w}$ e $\frac{3}{mn}$

4 a $12a - 18$ b $-20x^2 - 28x$
c $-6a^2b^2 + 21a^2b$

5 a 12 b 6 c $4m$ d $3x$

6 a $3(3k + 5)$ b $4(3m - 2n)$
c $-3(2t - 3)$ d $-5(2x + y)$
e $a(5a - 7)$ f $3ac(4b + 5)$

7 a $4x - 7$ b $2k + 3$ c $3(m + n)$ d $16p$
e $\frac{4z}{5}$ f $-4n$ g $\frac{3m}{5k}$ h $\frac{y}{4}$

Check your skills

1 By inspection, state the value of the pronumeral if $5q = 40$.

A 9 B 5 C 8 D 6

2 Which option shows how the expression $\frac{6-3n}{4}$ is built?

A $6 \xrightarrow{-3} 6-3 \xrightarrow{\times n} 6-3n \xrightarrow{\div 4}$

B $n \xrightarrow{\times 3} 3n \xrightarrow{-6} 3n-6 \xrightarrow{\div 4}$

C $3 \xrightarrow{\times n} 3n \xrightarrow{+6} 3n+6 \xrightarrow{\div 4}$

D $n \xrightarrow{\times(-3)} -3n \xrightarrow{+6} -3n+6 \xrightarrow{\div 4}$

3 The equation $\frac{4x-6}{9} = 2$ has been solved using backtracking techniques. What are the values of parts **i**, **ii** and **iii** using this technique?

$x \xrightarrow{\times 4} 4x \xrightarrow{-6} 4x-6 \xrightarrow{\div 9} \frac{4x-6}{9}$

iii $\xleftarrow{\div 4}$ **ii** $\xleftarrow{+6}$ **i** $\xleftarrow{\times 9}$ 2

A i 18 ii 26 iii $4\frac{1}{3}$
B i 18 ii 24 iii 6
C i 18 ii 22 iii $5\frac{1}{2}$
D i 18 ii 20 iii 5

4 State the value of w in the equation $\frac{2w}{7} = 8$.

A 56 B 24 C 48 D 28

6 State the value of f in the equation $6(2f-7) = 2(4f+8)$.

A $14\frac{1}{2}$ B $3\frac{3}{4}$ C $12\frac{1}{2}$ D $10\frac{1}{4}$

7 If $I = \frac{PRT}{100}$, find I when $P = \$70\,000$, $R = 8.25$ and $T = \frac{7}{12}$.

A \$336.88 B \$3368.75 C \$33 687.50 D \$336 875

8 Given $E = mc^2$, find m when $E = 175$ and $c = 5$.

A 7 B 17.5 C 35 D 40

9 Write an equation using x as the unknown number. A certain number is subtracted from eight. When it is divided by three the result is four.

A $\frac{x-8}{3} = 4$ B $\frac{8-x}{3} = 4$ C $8 - \frac{x}{3} = 4$ D $8 - x = \frac{4}{3}$

13A Review set

1 Show each step required to get from the expression $5x + 15$ back to x.

2 Solve the following equations.

a $x + 11 = 18$
b $x + 9 = -12$
c $4x = 22$
d $-9x = 58$
e $3y + 18 = 26$
f $5 - 4p = -72$
g $4d + 8 = 3d - 15$
h $18 + 7c = 32 - 4c$
i $3(m + 6) = 4(m - 1)$
j $8(q - 5) = -2(10 + 3q)$

3 Solve the following equations.

a $\frac{4p}{5} = 9$
b $\frac{3x + 12}{7} = 13$
c $\frac{m - 8}{3} = 7$
d $\frac{2p + 7}{5} = 3$
e $\frac{p + 5}{2} = -3$
f $\frac{9 - 4p}{5} = -7$

4 Solve the following equations.

a $3(x - 4) = 2$
b $5(3x + 2) = 9$
c $-3(p + 4) = 6$
d $-4(6 - 5p) = 2$
e $3x + 5 = 7x - 3$
f $7 + 2x = 5x - 8$

5 Is the given value for the pronumeral a solution to the equation?

a $5d + 12 = 27;\ d = 3$
b $\frac{x}{5} + 7 = 25;\ x = 3\frac{2}{5}$

6 If $x = 4$ and $y = 7$, find the value of $3x - 5y$.

7 The volume, V, of a sphere is found using the formula $V = \frac{4}{3}\pi r^3$, where r is the radius. Find the volume of a sphere with radius:

a 8 cm
b 4.2 cm
c 0.9 m

8 The formula to convert temperature measurements from degrees Celsius, C, to degrees Fahrenheit, F, is $F = \frac{9}{5}C + 32$. Find F when:

a $C = 180°$
b $C = 15°$
c $C = 38°$

9 Solve the following equations.

a $d - 8 = 40$
b $x + 9 = 15$
c $\frac{x}{9} = 72$
d $11x = 66$
e $4x - 7 = 35$
f $3x - 12 = 70$
g $10 + 8n = 58$
h $12 - 6c = 78$
i $3(2x + 1) = 3$

10 Write an equation and solve this problem.

The sum of a certain number and 7 is 114. What is the number?

13B Review set

1 Show the steps required to get from the equation $15 - 4b = 35$ back to b.

2 Solve the following equations.

a $p - 5 = -20$ b $d + 8 = 3$

c $6x = -54$ d $-2x = -18$

e $11c + 21 = 73$ f $17 - 5q = -12$

g $-5(4n - 8) = 7(2n + 11)$ h $4(2 - 3c) = -2(5c + 3)$

3 Solve the following equations by collecting like terms.

a $7q - 7 = 18 - 2q$ b $-5 - 5m = 47$

4 Solve the following equations.

a $\frac{2 - 4k}{3} = -7$ b $13 - \frac{w}{2} = -13$

5 Solve these equations.

a $\frac{p - 7}{2} = 6$ b $\frac{3x - 4}{7} = 2$

c $\frac{x + 4}{3} = -1$ d $\frac{7 - 3p}{4} = -2$

e $5(p - 4) = 3$ f $6(3x - 5) = 7$

g $-4(x - 1) = 2$ h $-5(3 - 4p) = 1$

i $5x - 4 = 3x + 8$ j $4 + 5x = 12 - 3x$

6 If $a = -3$, $b = 5$ and $c = -2$, find the value of the following expressions.

a $4a + 3c - b$ b $\frac{5(abc)}{2}$

7 If $x = -2$ and $y = 3$ find the value of $5x - 7y$.

8 Solve the following equations.

a $d - 9 = 23$ b $x + 4 = 65$ c $\frac{x}{3} = 5$

d $11x = 121$ e $3x - 7 = 30$ f $4x - 12 = 15$

g $10 + 3n = 32$ h $12 - 9c = 43$ i $7(2x + 5) = 4$

j $4x - 2 = x + 9$ k $3(3 - 7x) = 4(x + 5)$ l $12 - 3(5 - x) = 9$

9 The formula to convert temperature measurements from degrees Fahrenheit, F, to degrees Celsius, C, is $C = \frac{5}{9}(F - 32)$. Find C when:

a $F = 248°$ b $F = 50°$ c $F = 32°$

10 Solve the following problems using equations.

a If a certain number is doubled the result is -8. What is the number?

b When four consecutive integers are added the result is 134. What are the integers?

13C Review set

1 Solve the following equations.

a $11n - 17 = -42$

b $2(q - 7) = 18$

c $-(p + 5) = 3(2p + 8)$

d $14 - \frac{3c}{5} = 11$

2 Is the given value for the pronumeral a solution to the equation?

a $-5w + 1 - 6w - 9 = -10; \quad w = \frac{2}{11}$

b $2a - 1 + 3a - 5 - 8 = 4; \quad a = 3\frac{3}{5}$

3 Solve these equations.

a $\frac{r + 5}{4} = 3$

b $\frac{4x - 7}{8} = 1$

c $\frac{x + 5}{-4} = 2$

d $\frac{3 - 8r}{7} = -2$

4 Given $x = -5$ and $y = 4$, find the value of $4x^2 - 6y$.

5 Solve the following equations.

a $d - 9 = 11$

b $x + 4 = 14$

c $\frac{x}{3} = 2$

d $11x = 77$

e $3x - 8 = 12$

f $7x - 12 = 19$

g $14 + 3n = 23$

h $23 - 4c = 11$

i $2(4x + 5) = 12$

6 Solve these equations.

a $4(r - 1) = 7$

b $5(2p - 7) = -5$

c $-3(x + 5) = 9$

d $-7(3x - 4) = -2$

e $4p - 7 = 5p + 9$

f $7x + 5 = -4 - 2x$

7 The surface area, A, of a cylinder is found using the formula $A = 2\pi r(r + h)$ where r is the radius and h is the height. Find the surface area of a cylinder with radius 15 cm and height 8 cm. Give the answer to the nearest whole number.

8 The time T s for a pendulum of length L m to swing back and forth once is give by the formula $T = 2\pi\sqrt{\frac{L}{g}}$ where $g \approx 10$ m/s^2. Find how long it takes for a pendulum of length 2.4 m to swing back and forth once.

9 Pythagoras' rule is $c = \sqrt{a^2 + b^2}$. Find c when:

a $a = 3, b = 4$

b $a = 5, b = 12$

c $a = 15, b = 20$

d $a = 16, b = 12$

10 Construct an equation and solve, using x as the pronumeral.

a The sum of three consecutive odd numbers is 39. What are the numbers?

b Twice a certain number is subtracted from 18. The result is the same as multiplying the number by four and adding 9. What is the number?

13D Review set

1 Solve the following equations.

a $-3 - 2p = -5$

b $7(2n + 15) = -33$

c $\frac{4c}{7} + 8 = 20$

d $3 - \frac{5p}{6} = -9$

2 Is the given value for the pronumeral a solution to the equation?

a $4(p + 7) = -3(p + 10)$; $p = 8\frac{1}{7}$

b $3m - \frac{2}{3} = 8$; $m = 2\frac{4}{9}$

3 Given $x = 12$ and $y = -7$, find the value of $6x^2 - 11y$.

4 The volume, V, of a cylinder is found using the formula $V = \pi r^2 h$ where r is the radius and h is the height. Find the volume of a cylinder with radius 12 cm and height 25 cm.

5 A formula for calculating the bend allowance, B in mm, of sheet metal is $B = 2\pi\left(R + \frac{T}{2}\right) \times \frac{A}{360}$ where B is the bend allowance, T is the thickness in mm, A is the number of degrees in the angle of bend, and R is the radius of curvature in mm. Find B when $T = 1.5$, $R = 4$, $A = 116$.

6 Solve the following equations.

a $d - 5 = 11$

b $x + 7 = 14$

c $\frac{x}{6} = 2$

d $7x = 77$

e $3x - 4 = 92$

f $8x - 12 = 11$

g $11 + 7n = 53$

h $27 - 9c = 31$

i $4(3x + 5) = 13$

7 Solve these equations.

a $\frac{m - 1}{3} = 2$

b $\frac{5p + 8}{3} = 2$

c $\frac{7 + p}{2} = 3$

d $\frac{14 - 5r}{2} = -3$

8 Solve these equations.

a $5(7 + r) = 2$

b $6(3p - 1) = -4$

c $-8(x - 2) = 3$

d $-7(5x - 4) = 2$

e $7r - 1 = 5r + 9$

f $7x + 9 = -3x - 1$

9 Construct an equation and solve, using x as the pronumeral.

a 4 is subtracted from a number and the result is multiplied by -8. The answer is 50. What is the number?

b 7 is subtracted from a number and the result is multiplied by 6. The answer is the same as multiplying the number by -2 and adding 9. What is the number?

10 If $I = \frac{PRT}{100}$, find I when $P = 8500$, $R = 4.25$ and $T = \frac{5}{12}$.

11 If $T = a + (n - 1)d$, find n when $T = 80$, $a = 6$ and $d = 4$.

12 a Given that $V = IR$, find V when $I = 10$ and $R = 250$.

b Given that $V = IR$, find V when $I = 50$ and $R = 20$.

c Given that $W = Fs$, find W when $F = 100$ and $s = 12$.

d Given that $s = \frac{d}{t}$, find s when $d = 50$ and $t = 10$.

Check your skills

1 C 2 D 3 B 4 D 5 B
6 A 7 B 8 A 9 B

Review set 13A

1 $5x + 15$ $\xrightarrow{-15}$ $5x$ $\xrightarrow{\div 5}$ x

2 a $x = 7$ b $x = -21$ c $x = 5\frac{1}{2}$
d $x = -6\frac{4}{9}$ e $y = 2\frac{2}{3}$ f $p = 19\frac{1}{4}$
g $d = -23$ h $c = 1\frac{3}{11}$ i $m = 22$
j $q = 1\frac{3}{7}$

3 a $p = 11\frac{1}{4}$ b $x = 26\frac{1}{3}$ c $m = 29$
d $p = 4$ e $p = -11$ f $p = 11$

4 a $x = 4\frac{2}{3}$ b $x = -\frac{1}{15}$ c $p = -6$
d $p = \frac{13}{10}$ e $x = 2$ f $x = 5$

5 a Yes b No

6 -23

7 a 2145 cm^3 b 310 cm^3 c 3.1 m^3

8 a 356° b 59° c 100.4°

9 a $d = 48$ b $x = 6$ c $x = 648$
d $x = 6$ e $x = 10\frac{1}{2}$ f $x = 27\frac{1}{3}$
g $n = 6$ h $c = -11$ i $x = 0$

10 $x + 7 = 114$; $x = 107$

Review set 13B

1 b $\xrightarrow{\times(-4)}$ $-4b$ $\xrightarrow{+15}$ $15 - 4b$
-5 $\xrightarrow{\div(-4)}$ 20 $\xrightarrow{-15}$ 35

2 a $p = -15$ b $d = -5$ c $x = -9$
d $x = 9$ e $c = 4\frac{8}{11}$ f $q = 5\frac{4}{5}$
g $n = -1\frac{3}{34}$ h $c = 7$

3 a $q = 2\frac{7}{9}$ b $m = -10\frac{2}{5}$

4 a $k = 5\frac{3}{4}$ b $w = 52$

5 a $p = 19$ b $x = 6$ c $x = -7$
d $p = 5$ e $p = 4\frac{3}{5}$ f $x = \frac{37}{18}$
g $x = \frac{1}{2}$ h $p = \frac{4}{5}$ i $x = 6$
j $x = 1$

6 a -23 b 75

7 -31

8 a $d = 32$ b $x = 61$ c $x = 15$
d $x = 11$ e $x = 12\frac{1}{3}$ f $x = 6\frac{3}{4}$
g $n = 7\frac{1}{3}$ h $x = -3\frac{4}{9}$ i $x = -2\frac{3}{14}$
j $x = 3\frac{2}{3}$ k $x = -\frac{11}{25}$ l $x = 4$

9 a 120° b 10° c 0°

10 a $2x = -8$; $x = -4$ b 32, 33, 34, 35

Review set 13C

1 a $n = -2\frac{3}{11}$ b $q = 16$
c $p = -4\frac{1}{7}$ d $c = 5$

2 a Yes b Yes

3 a $r = 7$ b $x = 3\frac{3}{4}$
c $x = -13$ d $r = 2\frac{1}{8}$

4 76

5 a $d = 20$ b $x = 10$ c $x = 6$
d $x = 7$ e $x = 6\frac{2}{3}$ f $x = 4\frac{3}{7}$
g $n = 3$ h $c = 3$ i $x = \frac{1}{4}$

6 a $r = 2\frac{3}{4}$ b $p = 3$ c $x = -8$
d $x = 1\frac{3}{7}$ e $p = -16$ f $x = -1$

7 2168 cm^2 8 3.1 s

9 a 5 b 13 c 25 d 20

10 a $x + 1 + x + 3 + x + 5 = 39$; 11, 13, 15
b $18 - 2x = 4x + 9$; $x = 1\frac{1}{2}$

Review set 13D

1 a $p = 1$ b $n = -9\frac{6}{7}$
c $c = 21$ d $p = 14\frac{2}{5}$

2 a No b No

3 941 4 11 310 cm^3

5 $B = 9.6$ mm

6 a $d = 16$ b $x = 7$ c $x = 12$
d $x = 11$ e $x = 32$ f $x = 2\frac{7}{8}$
g $n = 6$ h $c = -\frac{4}{9}$ i $x = -\frac{7}{12}$

7 a $m = 7$ b $p = -\frac{2}{5}$
c $p = -1$ d $r = 4$

8 a $r = -6\frac{3}{5}$ b $p = \frac{1}{9}$ c $x = 1\frac{5}{8}$
d $x = \frac{26}{35}$ e $r = 5$ f $x = -1$

9 a $-8(x - 4) = 50$; $x = -2\frac{1}{4}$
b $6(x - 7) = -2x + 9$; $x = 6\frac{3}{8}$

10 $I = 150\frac{25}{48}$ or \$150.52

11 $T = 19\frac{1}{2}$

12 a 2500 b 1000 c 1200 d 5

Solve each equation

1 $3x + 8 = 35$

2 $2n + 10 = 26$

3 $4a - 5 = 13$

4 $-3u + 4 = 10$

5 $5 + 4p = -11$

6 $6c - 7 = 26$

7 $\frac{d}{4} - 7 = 3$

8 $\frac{k}{3} + 6 = 8$

9 $\frac{6d}{5} = 18$

10 $\frac{3b}{8} = -21$

11 $-2m - 3 = -6$

12 $11 - 4h = 19$

13 $3(x + 6) = 12$

14 $\frac{y - 9}{2} = -6$

15 $13 - 3t = 4$

16 $\frac{4d - 4}{5} = 3$

17 $8 - 2i = 17$

18 $6x + 6 = 3x + 27$

19 $2(x + 8) = 10$

20 $9q - 20 = 4q + 35$

21 $\frac{2r}{5} + 1 = 7$

22 $2(2s - 3) = 14$

23 $6(4v - 3) = 66$

24 $\frac{2m + 6}{4} = -2$

25 $5(x - 2) = -40$

26 $3b - 8 = 7 - 2b$

27 $-5t + 1 = t + 25$

28 $12 - 9w = 6 - 8w$

29 $3(f + 4) = f - 6$

30 $4(2n - 5) = 3n + 2$

Answers

1 $x = 9$	**2** $n = 8$	**3** $a = 4\frac{1}{2}$	**4** $u = -2$	**5** $p = -4$
6 $c = 5\frac{1}{2}$	**7** $d = 40$	**8** $k = 6$	**9** $d = 15$	**10** $b = -56$
11 $m = 1\frac{1}{2}$	**12** $h = -2$	**13** $x = -2$	**14** $y = -3$	**15** $t = 3$
16 $d = 4\frac{3}{4}$	**17** $i = -4\frac{1}{2}$	**18** $x = 7$	**19** $x = -3$	**20** $q = 11$
21 $r = 15$	**22** $s = 5$	**23** $v = 3\frac{1}{2}$	**24** $m = -7$	**25** $x = -6$
26 $b = 3$	**27** $t = -4$	**28** $w = 6$	**29** $f = -9$	**30** $n = 4\frac{2}{5}$

Solve each equation.

1 $4(2d - 7) = 32$

2 $-5(x + 4) = 20$

3 $\frac{p + 8}{3} = -9$

4 $\frac{2k + 6}{7} = -3$

5 $3(4m + 1) = 2(5m + 8)$

6 $6(2w - 5) = 7w + 19$

7 $-4(y + 7) = -y - 7$

8 $\frac{3i - 4}{5} = -4$

9 $\frac{10 - h}{2} = 7$

10 $\frac{r + 2}{6} - 2 = -1$

11 $4(e - 3) - 2(e + 4) = 6$

12 $6(b + 2) + 3(b + 1) = 25$

13 $\frac{n}{5} + \frac{2n}{3} = 4$

14 $\frac{z}{2} - \frac{z}{4} = -2$

15 $\frac{4c + 3}{2} = \frac{5c - 1}{3}$

16 $\frac{10p - 20}{4} = \frac{2p + 14}{5}$

17 $\frac{4a}{5} - 6 = -2$

18 $7(g + 10) + 3(2g - 1) = 5$

19 $5(2v - 4) - 2(3v + 2) = -4$

20 $\frac{3f}{4} + \frac{f}{8} = 8$

Answers

1 $d = 7\frac{1}{2}$

2 $x = -8$

3 $p = -35$

4 $k = 7\frac{1}{2}$

5 $m = 6\frac{1}{2}$

6 $w = 9\frac{4}{5}$

7 $y = -7$

8 $i = -5\frac{1}{3}$

9 $h = -4$

10 $r = 4$

11 $e = 13$

12 $b = 1\frac{1}{9}$

13 $n = 4\frac{8}{13}$

14 $z = -8$

15 $c = -5\frac{1}{2}$

16 $p = 3\frac{5}{7}$

17 $a = 5$

18 $g = -4\frac{10}{13}$

19 $v = 5$

20 $f = 9\frac{1}{7}$

Solve the following equations in which x appears on both sides of the equals sign.

1 $3x + 9 = x + 17$

2 $5x - 1 = 2x + 8$

3 $5x - 11 = x - 3$

4 $13x + 7 = 3x + 57$

5 $2x + 3 = x - 5$

6 $11x + 6 = 5x + 42$

7 $x - 9 = 2x - 21$

8 $2x + 11 = 9x - 24$

15 $15x + 8 = 5x - 42$

16 $4(x + 4) = 3x + 22$

17 $3(x + 9) = x + 13$

18 $5(x + 1) = 4x + 17$

19 $4(2x + 1) = 6(x + 12)$

20 $9(2x + 3) = 3(5x + 4)$

Answers

1 $x = 4$

2 $x = 3$

3 $x = 2$

4 $x = 5$

5 $x = {}^{-}8$

6 $x = 6$

7 $x = 12$

8 $x = 5$

9 $x = 4$

10 $x = 8$

11 $x = 3$

12 $x = 9$

13 $x = {}^{-}12$

14 $x = {}^{-}3$

15 $x = {}^{-}5$

16 $x = 6$

17 $x = {}^{-}7$

18 $x = 12$

19 $x = 34$

20 $x = {}^{-}5$