

**2018 Year 10 math topic test: Algebraic manipulation and simplification** © itute 2018

Q1 If  $a = -2$ ,  $y = 3$  and  $n = -1$ , evaluate the following expressions.

a.  $5 - 2a + a^2 - ny$  3 marks

b.  $\frac{\sqrt[3]{n} - a}{n^3 + y}$  3 marks

c.  $\frac{y^2 \sqrt{a^2 - 5n}}{81}$  3 marks

Q2 Express the following expressions in **simplest** form.

a.  $\frac{5a}{2} - \frac{3b}{4}$  2 marks

b.  $\frac{2x+1}{3} - \frac{x-3}{2}$  2 marks

c.  $\frac{2}{a} + \frac{3}{b} - \frac{4}{c}$  3 marks



d.  $\frac{2}{3y} - \frac{3}{2y}$

2 marks

e.  $\frac{2x}{y} - \frac{y}{2x}$

3 marks

f.  $\frac{2a}{3b} - \frac{a}{4b} - \frac{5a}{12b}$

2 marks

g.  $\frac{2x+1}{x+3} - \frac{2x-1}{x+2}$

3 marks

h.  $\frac{2m}{9} \times \frac{27}{8n}$

1 mark

i.  $\frac{x(x+y)}{x-y} \times \frac{(x-y)^2}{x+y}$

2 marks

j.  $\frac{-a-b}{ab} \div \frac{a+b}{-a^2b}$

3 marks



Q3 Find the value of each pronumeral in [ ].

a.  $2n - 3 = \frac{1}{2}$ , [n]

2 marks

b.  $\frac{3}{7} = \frac{7d}{1+3}$ , [d]

2 marks

c.  $9 = \sqrt{2m}$ , [m]

2 marks

d.  $5(h+2) - 2(2h-1) = 12$ , [h]

2 marks

e.  $\frac{x}{\sqrt{5}} = \frac{5\sqrt{5}}{x}$ , [x]

2 marks

f.  $\frac{2w-1}{7} = \frac{w+4}{5}$ , [w]

2 marks



Q7 On Monday Mandy had twice as much money as Sandy.  
On Tuesday Mandy received \$15 from her dad, and Sandy received \$45 from her mum.  
After each person receiving the additional amount of money, Sandy had twice as much as Mandy.  
Let  $x$  be the amount Mandy had on Monday.

- a. In terms of  $x$  how much did Sandy have on Monday? 1 mark
- b. In terms of  $x$  how much did Sandy have on Tuesday? 1 mark
- c. Use the given information to set up an equation for  $x$ . 2 marks
- d. How much money did Mandy have on Monday? 2 marks