The Chain Rule - maths

Accelerated Mathematics (Curtin University)

WORKSHEET

The chain rule

1 Differentiate using the chain rule.

a $(x + 1)^2$

b $(3 - x)^2$

c $(5x - 3)^2$

d $(4 - 7x)^3$

e $(x + 5)^{-1}$

f $(8 - 2x)^{-3}$

g $(x^2 + 1)^3$

h $(4x^2 - 7)^5$

2 Differentiate the following functions.

a $(2x + 3)^4$

b $(5x - 2)^7$

c $4(3x - 5)^3$

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

e $(x + 3)^{-1}$

f $-3\left(\frac{1}{2}x + 1\right)^{-4}$

g $\dfrac{1}{4x-7}$

h $\frac{1}{3}(5-4x)^{-6}$

i $4(8x+1)^{\frac{1}{4}}$

j $\dfrac{1}{(2x+3)^5}$

k $7(x-3)^{-4}$

l $\dfrac{3}{(6x-1)^2}$

m $(9x+4)^5$

n $4(6-2x)^3$

o $\dfrac{7}{5(3x+1)^2}$

p $\dfrac{3}{2(4x-5)^3}$

Answers

1 **a** $2(x+1)$

b $-2(3-x)$

c $10(5x-3)$

d $-21(4-7x)^2$

e $-(x+5)^{-2}$

f $6(8-2x)^{-4}$

g $6x(x^2+1)^2$

h $40x(4x^2-7)^4$

2 **a** $8(2x+3)^3$

b $35(5x-2)^6$

c $36(3x-5)^2$

d $-40(7-4x)^4$

e $-(x+3)^{-2}$

f $6\left(\frac{1}{2}x+1\right)^{-5}$

g $\frac{-4}{(4x-7)^2}$

h $8(5-4x)^{-7}$

i $8(8x+1)^{-\frac{3}{4}}$

j $\frac{-10}{(2x+3)^6}$

k $-28(x-3)^{-5}$

l $\frac{-36}{(6x-1)^3}$

m $45(9x+4)^4$

n $-24(6-2x)^2$

o $\frac{-42}{5(3x+1)^3}$

p $\frac{-18}{(4x-5)^4}$