

Function: Operations, Compositions, Inverses Review

Name: _____

Block: _____

Date: _____

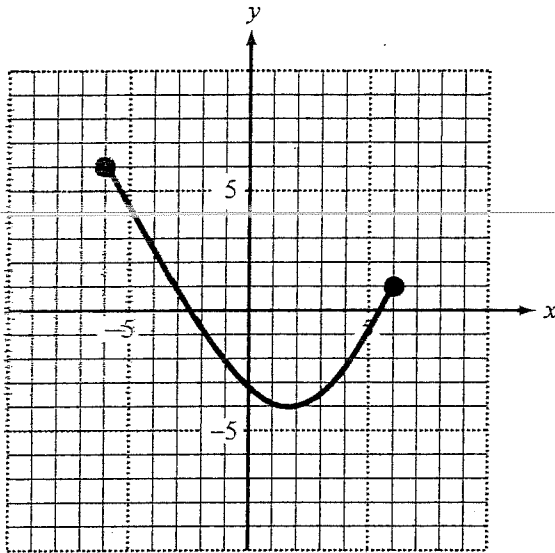
Total _____ = _____ %
65

SHOW ALL WORK WHERE APPROPRIATE OR PROVIDE RATIONALE FOR YOUR ANSWERS FOR FULL MARKS

1. Each of the following graphs represent $y = f(x)$ Find the indicated value for each of the following from the graph.

a) *ai*) $f(-3)$

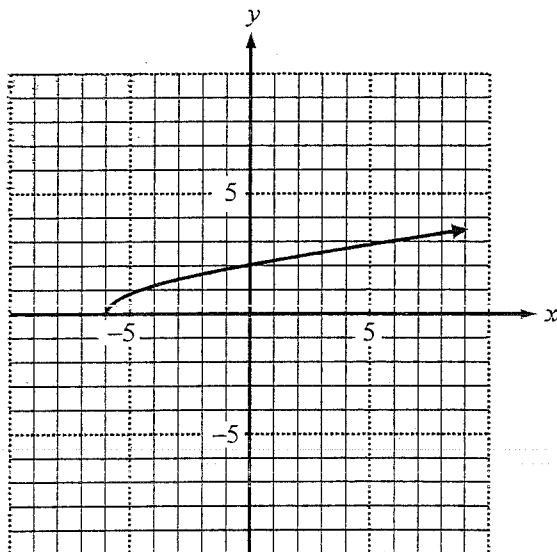
aii) $f(6)$



a) _____
2 marks

b) *bi*) $f(0)$

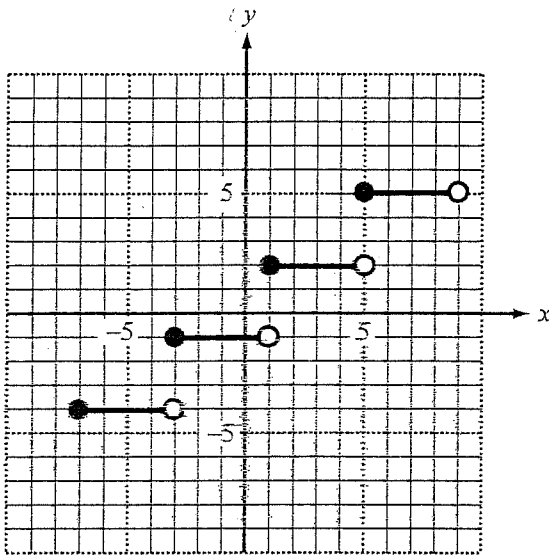
bii) $f(x) = 0$



b) _____
2 marks

c) ci) $f(-3)$

cii) $f(9)$



c) _____
2 marks

2. Given $f(x) = 3x - 1$ and $g(x) = 2x + 5$, find $(f + g)(x + 1)$. State any restrictions.

2) _____
3 marks

3. Given $f(x) = x^2 - 2x - 8$ and $g(x) = x^2 - 4$, find $\left(\frac{f}{g}\right)(-1)$. State any restrictions.

3) _____
3 marks4. Given $f(x) = 2\sqrt{3x}$ and $g(x) = 4\sqrt{12x}$, find $(f - g)(9)$. State any restrictions.4) _____
3 marks5. Given $f(x) = \frac{2}{x-6}$ and $g(x) = \frac{1}{x+1}$, find $(f + g)(x)$. State any restrictions.5) _____
3 marks

6. Given $f(x) = x^2 - 9$ and $g(x) = x^2 + 3x - 1$, find $(fg)(x)$.

6) _____
3 marks

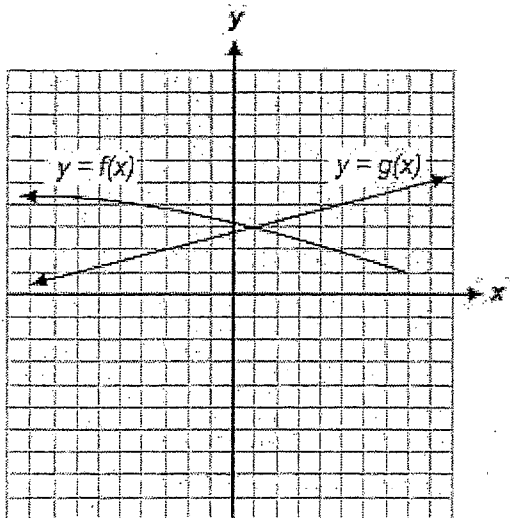
7. Use the graphs of $f(x)$ and $g(x)$ to evaluate the following: (1 mark each)

a) $(f + g)(1)$

b) $(f - g)(5)$

c) $\left(\frac{f}{g}\right)(-3)$

d) $(fg)(5)$



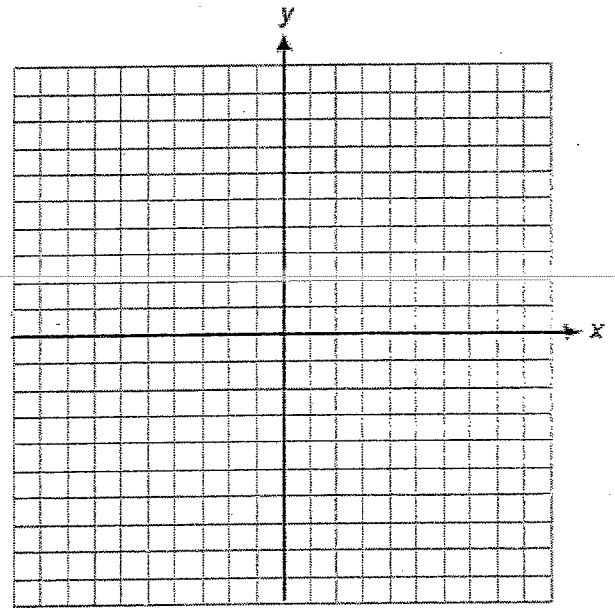
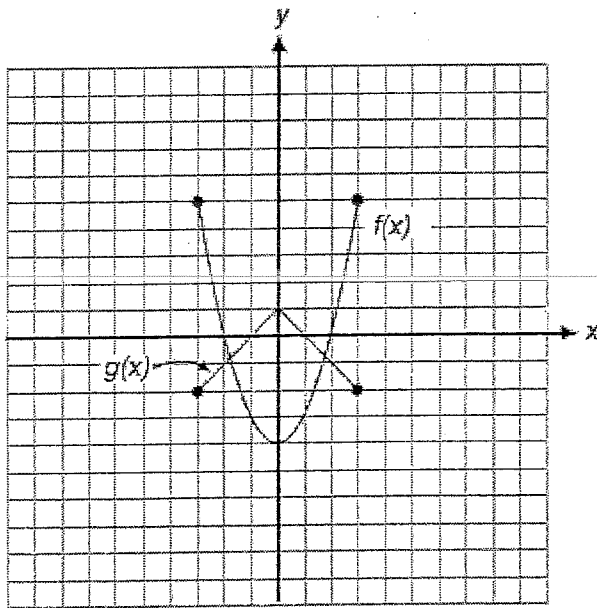
7a) _____

7b) _____

7c) _____

7d) _____
4 marks

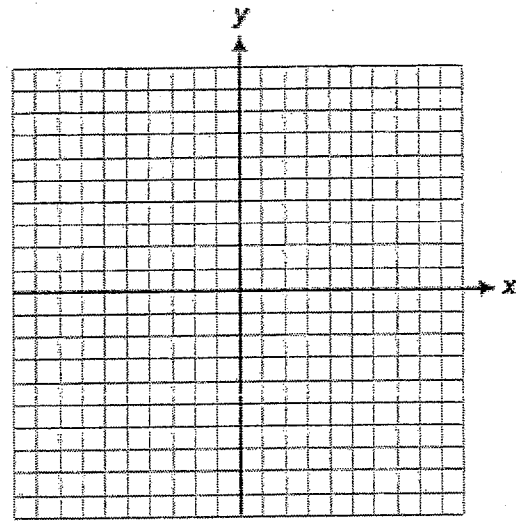
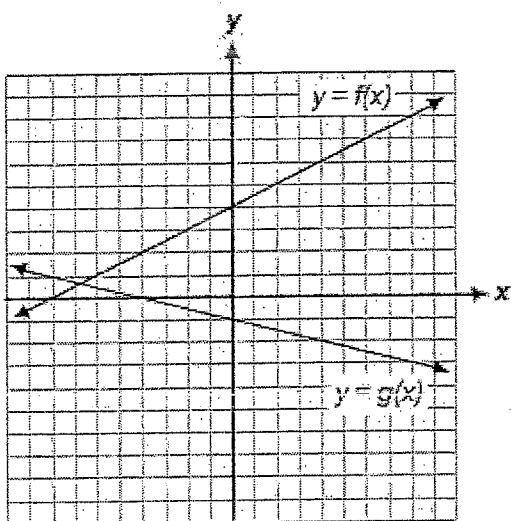
8. Sketch the graph of the combined function of $y = (g - f)(x)$ for the following functions of $f(x)$ and $g(x)$ on the grid provided.



2 marks

9. Given the graphs of $y = f(x)$ and $y = g(x)$ sketch the graph of $k(x)$ given

$$k(x) = \left(\frac{f}{g}\right)(x)$$



2 marks

10. Given $(f + g)(x) = 10 - 3x$ and $(f - g)(x) = 5x - 14$, find $f(x)$ and $g(x)$.

10) _____

3 marks

11. Given $f(x) = 3x + 2$ and $g(x) = 2x^2 - 1$ find the following and state if the composite function exists. Explain why or why not.

a) $(f \circ g)(x)$

a) _____
3 marks

b) $(g \circ f)(x)$

b) _____
3 marks

12. Given $f(x) = \sqrt{x+4}$ and $g(x) = -2x^2 - 5$ find the following and state if the composite function exists. Explain why or why not.

a) $(f \circ g)(x)$

a) _____
3 marks

b) $(g \circ f)(x)$

b) _____
3 marks

13. Given $f(x) = \frac{3}{5-x}$ and $g(x) = 2x - 1$ find the following and state any restrictions.

a) $(f \circ g)(x)$

a) _____
3 marks

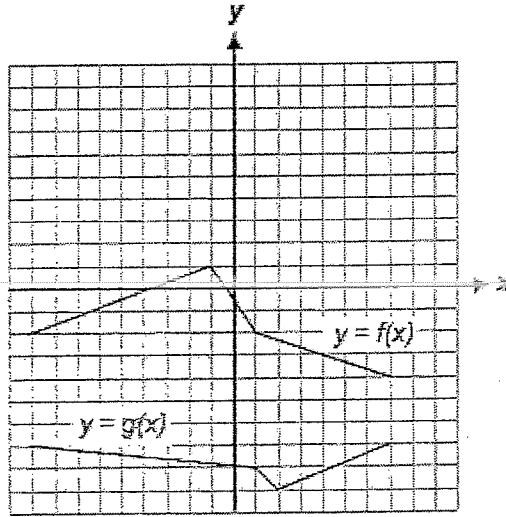
b) $(g \circ f)(\sqrt{2})$ (Rationalize denominator in answer)

b) _____
3 marks

14. Use the graphs of $f(x)$ and $g(x)$ to evaluate the following:

a. $f(g(2))$

b. $g(f(-1))$

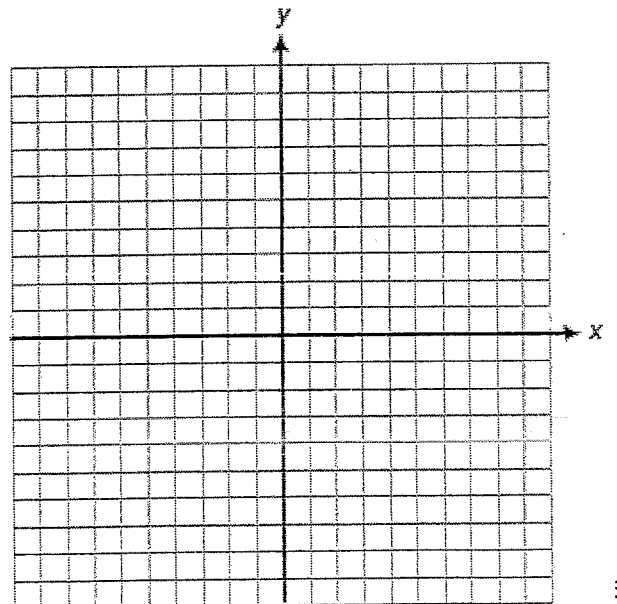


a) _____
2 marks

b) _____
2 marks

15. Given: $f(x) = 2x - 6$ and $g(x) = x + 3$

Sketch the graph of $f(x)$, $g(x)$, $(f \circ g)(x)$, and $(g \circ f)(x)$ on the grid provided.



4 marks

16. Tracey lives in Saskatoon, Saskatchewan and wants to buy a new road bike at a local bike shop. All bikes are marked as 25% off. Saskatchewan has a provincial sales tax of 5% which along with the federal GST of 5% is added to the selling price.
- Write a function $s(p)$, that relates the regular price, p , in dollars, to the sale price, s , in dollars.
 - Write the function $t(s)$, that relates the sales price, s , in dollars, to the total cost including tax, t , in dollars.
 - Write a composite function that expresses the cost in terms of the regular price. Calculate how much Brent would pay for a new road bike that normally sold for \$1550.

16) _____

4 marks

17. Prove that $f(x)$ and $g(x)$ are inverses using composite functions if:

$$f(x) = 3^{2-x} \quad \text{and} \quad g(x) = -\log_3 x + 2 \quad (\text{omit})$$

