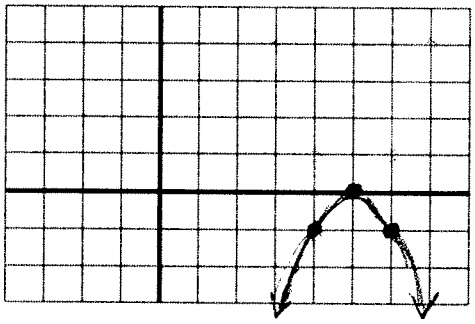
MCR3U 1.5 – 2.6 Additional review questions

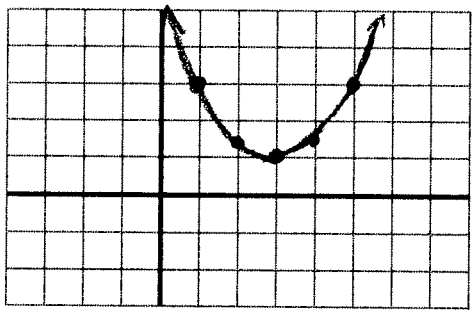
1. Complete the following questions from the textbook: p. 70 # 9, 12a, 15. and p. 73 # 16, 19, 20.

2. Sketch the following quadratic functions and state all transformations from the graph of $f(x) = x^2$.

$g(x) = -(x-5)^2$ V(5,0)

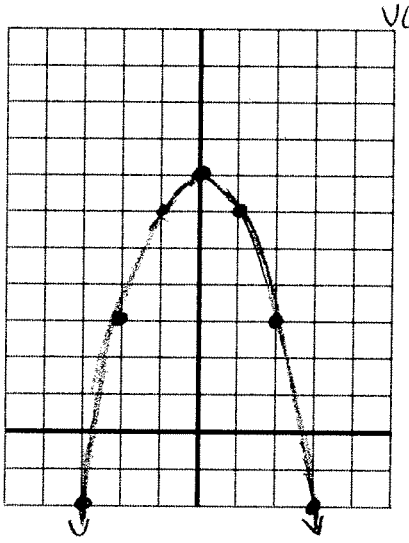


$h(x) = \frac{1}{2}(x-3)^2 + 1$ V(3,1)

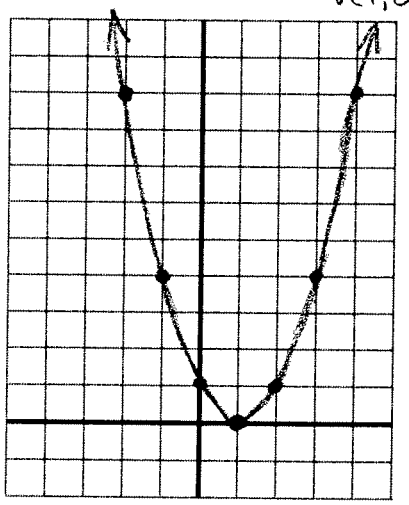


3. Graph each of the following functions and state the transformation in each case.

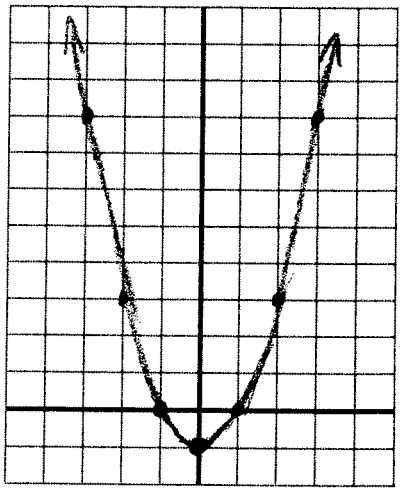
$f(x) = 7 - x^2 = -x^2 + 7$ V(0,7)



$f(x) = (x-1)^2$ V(1,0)



$f(x) = x^2 - 1$ V(0,-1)



4. Describe how the graph of $g(x) = (3x)^2$ is different from the graph of $h(x) = 3x^2$.

$= 9x^2$

stretched ×9 vertically

(OR compressed by $\frac{1}{3}$ horizontally)

stretched by 3 vertically

5. Write an equation for each function formed from the base graph $f(x)=x^2$ using the given transformations

a) reflected vertically
vertical stretch factor of 4
translated 7 units to the right

$y = -4(x-7)^2$

b)
vertical compression factor of 1/3
translated 4 units to the left

$y = \frac{1}{3}(x+4)^2$

c) vertical reflection
translated 5 units up

$y = -(x)^2 + 5$

$= -x^2 + 5$

Questions

1. $112x^2 - 700$
2. $12x^2 + 59x + 72$
3. $45x^2 - 980$
4. $x^2 - 18x + 77$
5. $x^2 + 5x - 50$
6. $12x^2 + 31x + 7$
7. $4x^2 - 225$
8. $8x^2 + 26x - 45$
9. $7x^2 - 63$
10. $x^2 + 6x - 7$
11. $x^2 - 8x - 48$
12. $28x^2 - 1575$
13. $x^2 + 7x + 6$
14. $20x^2 - 180$
15. $27x^2 - 588$
16. $4x^2 - 9$
17. $15x^2 - 2x - 45$
18. $48x^2 - 432$
19. $20x^2 - 180$
20. $6x^2 + 7x + 2$
21. $x^2 + 2x + 1$

2. $12x^2+59x+72$
$=12x^2+32x+27x+72$
$=4x(3x+8)+9(3x+8)$
$=(4x+9)(3x+8)$
[TOUGH]

4. $x^2-18x+77$
$=(x-11)(x-7)$

5. $x^2+5x-50$
$=(x+10)(x-5)$

6. $12x^2+31x+7$
$=12x^2+28x+3x+7$
$=4x(3x+7)+(3x+7)$
$=(4x+1)(3x+7)$
TOUGH

7. $4x^2-225$
$=(2x-15)(2x+15)$

8. $8x^2+26x-45$
$=8x^2+36x-10x-45$
$=4x(2x+9)-5(2x+9)$
$=(4x-5)(2x+9)$

9. $7x^2-63$
$=7(x^2-9)$
$=7(x-3)(x+3)$

10. x^2+6x-7
$=(x+7)(x-1)$

11. $x^2-8x-48$
$=(x-12)(x+4)$

13. x^2+7x+6
$=(x+6)(x+1)$

14. $20x^2-180$
$=20(x^2-9)$
$=20(x-3)(x+3)$

15. $27x^2-588$
$=3(9x^2-196)$
$=3(3x-14)(3x+14)$

16. $4x^2-9$
$=(2x-3)(2x+3)$

17. $15x^2-2x-45$
$=15x^2+25x-27x-45$
$=5x(3x+5)-9(3x+5)$
$=(5x-9)(3x+5)$