

## EXAM REVIEW SOLUTIONS

\*\*\*\* Graphing solutions are to be verified with your teacher \*\*\*\*

### Introducing Functions (Chapter 1)

1. a)  $f(-2) = 7$                       b)  $f(a^2 + 1) = \sqrt{a^2 + 4}$
2. a)  $f^{-1}(x) = \frac{x+3}{2}$                   b)  $f^{-1}(x) = \pm \sqrt{\frac{x+5}{2}}$       c)  $f^{-1}(x) = \sqrt{\frac{x-4}{2}} + 3$
3.  $\left(\frac{1}{3}, 2\right)$
4. i) vertical expansion by a factor of 2                      ii) reflection in the x-axis  
       iii) horizontal compression by a factor of  $\frac{1}{3}$                   iv) reflection in the y-axis  
       v) horizontal translation right 1 unit and vertical translation down 5 units
5. See graphing solutions provided by teacher
6. D:  $\{x \mid x \geq -4, x \in R\}$                   R:  $\{y \mid y \leq 0, y \in R\}$
7. a) relation: yes                      b) relation: yes                      c) relation: no                      d) relation: yes  
       inverse: no                                  inverse: no                                  inverse: yes                                  inverse: no  
       e) relation: yes                      f) relation: yes  
       inverse: yes                                  inverse: no
8.  $k = -4$

### Rational Expressions and Quadratic Functions (Chapters 2 and 3)

1. a)  $V(6, 3)$                                   D:  $\{x \mid x \in R\}$                                   R:  $\{y \mid y \geq 3, y \in R\}$   
       b)  $V\left(-\frac{3}{8}, \frac{41}{16}\right)$                                   D:  $\{x \mid x \in R\}$                                   R:  $\left\{y \mid y \leq \frac{41}{16}, y \in R\right\}$
2. a) 1 m    b) 4 s    c) 21m
3. a)  $R(x) = -3x^2 + 25x$                                   b)  $P(x) = -3x^2 + 18x - 15$   
       c) Production/sale of 3 units.                                  d) Production/sale of 1 or 5 units.
4. a) 2 zeroes                                  b) 1 zero    c) no zeroes                                  d) 1 zero  
       e) no zeroes                                  f) 2 zeroes
5. a)  $4\sqrt{3}$     b)  $18\sqrt{2}$     6.  $k = 4$
7. a) -1,5    b) 3,5, -1      c)  $\frac{-1 \pm 2\sqrt{6}}{-5}$     8.  $x^2 - 10x + 23 = 0$
9. a)  $f^{-1}(x) = -1 \pm \sqrt{x+9}$                                   b) See graphing solutions provided by teacher
10. a)  $\frac{7x+9}{(x+3)^2}, x \neq -3$                                   b)  $\frac{x^2+2x-6}{3(x-2)(x+2)}, x \neq \pm 2$                                   c)  $2x, x \neq -4, 0$   
       d)  $x-1, x \neq \pm \frac{1}{2}, -1, -\frac{3}{2}$                                   e)  $\frac{1}{x(x-1)}, x \neq 0, 1$                                   f)  $\frac{x^3+5x^2+4x-20}{16x^3}, x \neq 0$
11. a)  $54\sqrt{2}$     b) 20    c)  $4\sqrt{6}$
12. a)  $V\left(\frac{65}{42}, \frac{-1585}{252}\right)$     b)  $V\left(\frac{-15}{16}, \frac{-1273}{128}\right)$

