

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Unit 9 Quadratics Quiz Review

Questions 1 through 3 refer to the following:

Express the given radical in simplest radical form:

- 1)  $\sqrt{128}$   
 A)  $32\sqrt{2}$                       C)  $64\sqrt{2}$   
 B)  $8\sqrt{2}$                          D)  $16\sqrt{2}$
- 2)  $\sqrt{288}$   
 A)  $96\sqrt{3}$                       C)  $48\sqrt{6}$   
 B)  $12\sqrt{2}$                       D)  $36\sqrt{8}$
- 3)  $-\sqrt{108}$   
 A)  $-4\sqrt{27}$                       C)  $-6\sqrt{3}$   
 B)  $-36\sqrt{3}$                       D)  $-52\sqrt{2}$
- 4) When  $\sqrt{72}$  is expressed in simplest  $a\sqrt{b}$  form, what is the value of  $a$ ?  
 A) 3                                      C) 8  
 B) 2                                      D) 6
- 5) What is the sum of  $\sqrt{18}$  and  $\sqrt{72}$ ?  
 A)  $\sqrt{90}$                           C)  $9\sqrt{2}$   
 B)  $3\sqrt{10}$                          D)  $6\sqrt{3}$
- 6) What is the sum of  $\sqrt{75}$  and  $\sqrt{3}$ ?  
 A) 18                                    C)  $\sqrt{78}$   
 B)  $6\sqrt{3}$                           D) 15

Questions 7 through 9 refer to the following:

Solve the given quadratic equation by taking a square root and express irrational roots in radical form:

7)  $(x + 5)^2 - 7 = 0$

**Show your work.****Answer:** \_\_\_\_\_

8)  $2(x - 3)^2 - 12 = 0$

**Show your work.****Answer:** \_\_\_\_\_

9)  $2(x + 3)^2 - 64 = 0$

**Show your work.****Answer:** \_\_\_\_\_

Questions 10 and 11 refer to the following:

Solve the given equation, using factoring methods, for *all* values of the variable:

10)  $-16y = 2y^2 + 30$

**Show your work.****Answer:** \_\_\_\_\_

11)  $27 = x^2 + 2$

**Show your work.****Answer:** \_\_\_\_\_

12) What are the roots of the equation

$2x^2 + 7x - 1 = 0?$

A)  $\frac{-7 \pm \sqrt{57}}{4}$

C)  $\frac{7 \pm \sqrt{41}}{4}$

B)  $\frac{7 \pm \sqrt{57}}{4}$

D)  $\frac{-7 \pm \sqrt{41}}{4}$

13) What are the roots of the equation

$x^2 + 3x - 1 = 0?$

A)  $\frac{3 \pm \sqrt{5}}{2}$

C)  $\frac{-3 \pm \sqrt{5}}{2}$

B)  $\frac{3 \pm \sqrt{13}}{2}$

D)  $\frac{-3 \pm \sqrt{13}}{2}$

Questions 14 through 16 refer to the following:

Solve the given equation using the quadratic formula and express the answer in radical form if needed:

14)  $2x^2 + 5x - 1 = 0$

**Show your work.****Answer:** \_\_\_\_\_

15)  $3x^2 - 7x + 1 = 0$

**Show your work.****Answer:** \_\_\_\_\_

16)  $3x^2 = 2x + 2$

**Show your work.****Answer:** \_\_\_\_\_

- 17) If the square of a positive number is decreased by five times the number, the result is 14. Find the number.

*Show your work.*

*Answer:* \_\_\_\_\_

- 18) If the square of a negative number is decreased by 18, the result is three times the number. Find the number.

*Show your work.*

*Answer:* \_\_\_\_\_

- 19) The sum of the squares of two consecutive odd integers is 202. Find the integers.

*Show your work.*

*Answer:* \_\_\_\_\_

- 20) One of two positive integers is 7 less than the other. If the product of the two integers is 78, find the integers.

*Show your work.*

*Answer:* \_\_\_\_\_

- 21) The side of one square is 2 centimeters longer than the side of a second square. If the sum of their areas is  $100 \text{ cm}^2$ , find the length of the side of each square.

*Show your work.*

*Answer:* \_\_\_\_\_

- 22) What are the roots of the equation  $x^2 + 4x - 16 = 0$ ?

- A)  $2 \pm 2\sqrt{5}$                       C)  $-2 \pm 2\sqrt{5}$   
 B)  $2 \pm 4\sqrt{5}$                       D)  $-2 \pm 4\sqrt{5}$

- 23) (a) Write an equation that defines  $m(x)$  as a trinomial where  $m(x) = (3x - 1)(3 - x) + 4x^2 + 19$ . [*Show your work.*]

- (b) Use your answer from *part (a)* to solve for  $x$  when  $m(x) = 0$ . [*Show your work.*]

1) B    2) B    3) C    4) D    5) C

6) B

7)  $-5 \pm \sqrt{7}$

WORK SHOWN:  $(x + 5)^2 - 7 = 0, (x + 5)^2 = 7, x + 5 = \pm \sqrt{7}, x = -5 \pm \sqrt{7}$

8)  $3 \pm \sqrt{6}$

WORK SHOWN:  $2(x - 3)^2 - 12 = 0, 2(x - 3)^2 = 12, (x - 3)^2 = 6, x - 3 = \pm \sqrt{6}, x = 3 \pm \sqrt{6}$

9)  $-3 \pm \sqrt{32}$  OR  $-3 \pm 4\sqrt{2}$

WORK SHOWN:  $2(x + 3)^2 - 64 = 0, 2(x + 3)^2 = 64, (x + 3)^2 = 32, x + 3 = \pm \sqrt{32}, x = -3 \pm \sqrt{32}$

10)  $\{-5, -3\}$

WORK SHOWN:  $-16y = 2y^2 + 30, 2y^2 + 16y + 30 = 0, 2(y^2 + 8y + 15) = 0, 2(y + 5)(y + 3) = 0, y + 5 = 0, y = -5$  OR  $y + 3 = 0, y = -3$

11)  $\pm 5$

WORK SHOWN:  $27 = x^2 + 2, x^2 - 25 = 0, (x - 5)(x + 5) = 0, x - 5 = 0, x = 5$  OR  $x + 5 = 0, x = -5$

12) A    13) D

14)  $\frac{-5 \pm \sqrt{33}}{4}$

WORK SHOWN:  $2x^2 + 5x - 1 = 0, x = \frac{-5 \pm \sqrt{25 - 4(2)(-1)}}{2(2)} = \frac{-5 \pm \sqrt{25 + 8}}{4} = \frac{-5 \pm \sqrt{33}}{4}$

15)  $\frac{7 \pm \sqrt{37}}{6}$

WORK SHOWN:  $3x^2 - 7x + 1 = 0, x = \frac{7 \pm \sqrt{49 - 4(3)(1)}}{2(3)} = \frac{7 \pm \sqrt{49 - 12}}{6} = \frac{7 \pm \sqrt{37}}{6}$

16)  $\frac{1 \pm \sqrt{7}}{3}$

WORK SHOWN:  $3x^2 = 2x + 2, 3x^2 - 2x - 2 = 0, x = \frac{2 \pm \sqrt{4 - 4(3)(-2)}}{2(3)} = \frac{2 \pm \sqrt{4 + 24}}{6} = \frac{2 \pm \sqrt{28}}{6} = \frac{1 \pm \sqrt{7}}{3}$

17) 7

WORK SHOWN:  $x = \text{pos. number}, x^2 - 5x = 14, x^2 - 5x - 14 = 0, (x - 7)(x + 2) = 0; x = -2$  (reject) OR  $x = 7$

18) -3

WORK SHOWN:  $x = \text{neg. number}, x^2 - 18 = 3x, x^2 - 3x - 18 = 0, (x - 6)(x + 3) = 0; x = 6$  (reject) OR  $x = -3$

19)  $\pm 9$  and  $\pm 11$

WORK SHOWN:  $x = 1\text{st odd integer}, x + 2 = \text{next odd integer}, x^2 + (x + 2)^2 = 202, x^2 + x^2 + 4x + 4 = 202, 2x^2 + 4x - 198 = 0, x^2 + 2x - 99 = 0, (x + 11)(x - 9) = 0; x + 11 = 0, x = -11, (-11) + 2 = -9$  OR  $x - 9 = 0, x = 9, (9) + 2 = 11$

20) 6 and 13

WORK SHOWN:  $x = 1\text{st pos integer}, x - 7 = 2\text{nd pos integer}, x(x - 7) = 78, x^2 - 7x - 78 = 0, (x - 13)(x + 6) = 0; x = 13, (13) - 7 = 6$  OR  $x = -6$  (reject)

21) 6 cm and 8 cm

WORK SHOWN:  $x = \text{side of square 1}, x - 2 = \text{side of square 2}, x^2 + (x - 2)^2 = 100, x^2 + x^2 - 4x + 4 = 100, 2x^2 - 4x - 96 = 0, x^2 - 2x - 48 = 0, (x - 8)(x + 6) = 0; x = 8, (8) - 2 = 6$  OR  $x = -6$  (reject)

22) C

23) (a)  $m(x) = 10x + x^2 + 16$

WORK SHOWN:  $(3x - 1)(3 - x) + 4x^2 + 19, 9x - 3x^2 - 3 + x + 4x^2 + 19, 10x + x^2 + 16;$ 

(b)  $x = -8, -2$

WORK SHOWN:  $10x + x^2 + 16 = 0, x^2 + 10x + 16 = 0, (x + 8)(x + 2) = 0$ , If  $x + 8 = 0$ , then  $x = -8$ . If  $x + 2 = 0$ , then  $x = -2$ .