

MATH 160 Review Exam 1 SPRING 2010

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

1. Identify as expression, equation or inequality:

(a)  $3x^2 + 5x - 12$  : (i) equation (ii) inequality (iii) expression

(b)  $6x + 1 = -x^2 - 8$  : (i) equation (ii) inequality (iii) expression

(c)  $x - 21 > 0$  : (i) equation (ii) inequality (iii) expression

2. Solve :  $\frac{3x}{2} + 1 = x$

a) -2                                      b) 3                                      c) -3                                      d) 1

3. Solve :  $\frac{2}{x-1} + 5 = \frac{1}{x-1}$

a)  $\frac{4}{5}$                                       b)  $\frac{5}{4}$                                       c) 1                                      d) 5

4. Identify the index and radicand of the given radical:  $\sqrt[3]{7}$  : Index: \_\_  
Radicand : \_\_

a) index = 3 , radicand = 7              b) index = 7 , radicand = 3

5. Simplify the following :  $\sqrt[7]{\sqrt{2^{14}}}$

a) 4                                      b) 2                                      c) 16                                      d) 8

6. Simplify :  $\frac{8^{\left(\frac{3}{4}\right)}}{8^{\left(-\frac{1}{4}\right)}}$

a) 1                                      b) 8                                      c) 2                                      d) 4

7. Simplify :  $\sqrt[10]{(-17)^{10}}$

a) 17                                      b) -17                                      c) 10                                      d) 1

8. Simplify :  $\sqrt[3]{x^7}$

a)  $\sqrt{x}$                                       b)  $x^2\sqrt{x}$                                       c)  $x^4$                                       d)  $x^{10}$

9. Simplify :  $(\sqrt{a})(\sqrt{a}) =$

a)  $2\sqrt{a}$                                       b)  $a$                                       c)  $a^2$                                       d)  $2a$

10. Simplify :  $(\sqrt{a} - a)(\sqrt{a} + a)$

- a)  $a - a^2$       b) 0      c)  $a$       d)  $a^2 - a$
11. Rationalize the denominator :  $\frac{x+1}{\sqrt{7}}$
- a)  $\frac{x+1}{7}$       b)  $\frac{\sqrt{7}(x+1)}{7}$       c)  $\frac{\sqrt{7}(x-1)}{7}$       d) none
12. Rationaliz the denominator:  $\frac{5}{\sqrt{13}-\sqrt{8}}$
- a)  $\sqrt{13} + \sqrt{8}$       b)  $5(\sqrt{13} + \sqrt{8})$       c)  $\frac{5}{\sqrt{5}}$       d)  $\sqrt{5}$
13. For the quadratic equation :  $3x^2 - 7x + 2 = 0$  which of the following is false:
- a)  $a = 3$       b)  $b = -7$       c)  $c = 2$       d)  $b = 7$
14. Solve by extracting roots:
- | Equation:             | Roots( or solutions):   |
|-----------------------|---|
| a. $x^2 = 7$ :        | (i) $x = \pm\sqrt{7}$ (ii) $x = \pm 7$ (iii) $x = \sqrt{7}$   |
| b. $(x - 2)^2 = 25$ : | (i) $x = -3, 7$ (ii) $x = 3, -7$ (iii) $x = 3, 7$   |
| c. $(3x + 1)^2 = 9$ : | (i) $x = \frac{-4}{3}, \frac{2}{3}$ (ii) $x = \frac{4}{3}, \frac{-2}{3}$ (iii) $x = \frac{4}{3}, \frac{1}{3}$ |
15. Solve by factoring :  $x^2 - 6x + 8 = 0$
- a)  $x = 4, 2$       b)  $x = -4, -2$       c)  $x = 3, 2$       d)  $x = 1, 3$
16. Write the missing number to get a perfect sqaure on the quadratic expression as indicated:
- a.  $x^2 + 4x + \underline{\hspace{2cm}} = (x + 2)^2$  : (i) 4      (ii) 2      (iii) 16
- b.  $x^2 - 3x + \underline{\hspace{2cm}} = (x - \frac{3}{2})^2$  : (i)  $\frac{-3}{2}$       (ii)  $\frac{9}{4}$       (iii) 9
- c.  $x^2 - 6x + \underline{\hspace{2cm}} = (x - 3)^2$  : (i) 9      (ii) -3      (iii) 3
17. Solve by completing the square method:  $x^2 + 4x = 1$
- a)  $x = -2 \pm \sqrt{5}$       b)  $x = 2 \pm \sqrt{5}$       c)  $x = 23, -27$       d) none
18. Solve by completing the square method:  $x^2 - 6x = -2$
- a)  $3 + \sqrt{7}, 3 - \sqrt{7}$       b) 10, -4      c)  $3 + \sqrt{7}$       d)  $3 - \sqrt{7}$

19. Using the sign of the discriminant :  $b^2 - 4ac$  of the quadratic equation, determine the number and type of roots:

<u>Equation:</u>	<u>Sign of <math>b^2 - 4ac</math> :</u>	<u>Number and type of root(s):</u>
a. $x^2 - 4x + 4 = 0$ :	-----	-----
b. $x^2 - 8x + 15 = 0$ :	-----	-----
c. $2x^2 + 2x + 1 = 0$ :	-----	-----

20. The real solution(s) of the equation:  $\sqrt{2z + 3} = z$  is(are)

a) 3                      b) -1, 3                      c) -1                      d) 2, 5

21. Solve the inequality:  $2x - 3 \leq 0$ :

a.  $[\frac{3}{2}, \infty)$                       b.  $(-\infty, \infty)$                       c.  $(-\infty, \frac{3}{2}]$                       d.  $(2, 3)$

22. The solution set of the inequality :  $-6 < 3x \leq 7$  :

a.  $(\frac{-4}{3}, 3)$                       b.  $[-2, \frac{7}{3})$                       c.  $(-2, \frac{7}{3}]$                       d.  $\emptyset$

23. Solve :  $(x + 3)(x - 2) < 0$  :

a.  $(-\infty, -3) \cup (2, \infty)$                       b.  $(-3, 2)$                       c.  $\mathbb{R} \setminus \{2\}$                       d.  $\mathbb{R} \setminus \{-3, 2\}$

24. Solve the absolute value equation:  $|x| = 7$  :

a. 7                      b. -7                      c.  $\pm 7$                       d. 8

25. Solve :  $|x + 3| = 4$  :

a.  $x = 1$                       b.  $x = -7$                       c.  $x = -7, 1$                       d.  $x = -1$

26. Solve the following absolute value inequalities:  $|x| \leq 7$

a.  $-7 \leq x \leq 7$                       b.  $0 \leq x \leq 7$                       c.  $-7 \leq x \leq 0$                       d.  $x = \pm 7$

27. Solve:  $|3x - 2| \leq 1$

a.  $\frac{1}{3} \leq x \leq 1$                       b.  $\frac{-1}{3} \leq x \leq 1$                       c.  $-1 \leq x \leq 1$                       d. none

28. Solve absolute value inequality:  $|x - 1| \geq 4$

a.  $5 \geq x \geq -1$                       b.  $x \leq 5$  or  $x \geq -3$                       c.  $x \geq 5$  or  $x \leq -3$   
d.  $\emptyset$

29. The solution set for the inequality:  $\frac{x-1}{x+2} \geq 0$

a.  $(-2, 1]$                       b.  $(-\infty, -2)$                       c.  $[1, \infty)$                       d.  $\mathbb{R}$