

Do not remove this answer page — you will turn in the entire exam. You have two hours to do this exam. No books or notes may be used. You may use a graphing calculator during the exam, but NO calculator with a Computer Algebra System (CAS) or a QWERTY keyboard is permitted. Absolutely no cell phone use during the exam is allowed.

The exam consists of 15 multiple choice questions and 5 short answer questions. Record your answers on this page. For the multiple choice questions, you will need to fill in the box corresponding to the correct answer. For example, if (c) is correct, you must write

a b c d e

Do not circle answers on this page, but please do circle the letter of each correct response in the body of the exam. It is your responsibility to make it CLEAR which response has been chosen. You will not get credit unless the correct answer has been marked on both this page and in the body of the exam.

GOOD LUCK!

1. a b c d e

2. a b c d e

3. a b c d e

4. a b c d e

5. a b c d e

6. a b c d e

7. a b c d e

8. a b c d e

9. a b c d e

10. a b c d e

11. a b c d e

12. a b c d e

13. a b c d e

14. a b c d e

15. a b c d e

16.

17.

18.

19.

20.

For grading use:

Total	
	(out of 100 pts)

*Answers
inside
test*

Please make sure to list the correct section number on the front page of your exam and on this page.

Section #	Instructor	Lectures
018	Boucher	TR 2:00pm-3:15pm, CB 347
020	Boucher	TR 3:30pm-4:45pm, CB 339
004	Butcher	MWF 11:00am-11:50am, CB 337
009	Butcher	MWF 3:00pm-3:50pm, CB 337
016	Kilty	TR 12:30pm-1:45pm, CB 341
012	Kirby	TR 9:30am-10:45am, CB 347
015	Kirby	TR 12:30pm-1:45pm, CB 335
003	Li	MWF 11:00am-11:50am, CB 335
005	Li	MWF 12:00pm-12:50pm, CB 217
401	Mattingly	TR 6:00pm-7:15pm, CB 349
402	Mattingly	TR 7:30pm-8:45pm, CB 349
008	Nicolas	MWF 3:00pm-3:50pm, CB 335
017	Robinson	TR 2:00pm-3:15pm, CB 341
019	Robinson	TR 3:30pm-4:45pm, CB 335
001	Steil	MWF 9:00am-9:50am, CB 306
002	Steil	MWF 10:00am-10:50am, CB 337
006	Weaver	MWF 1:00pm-1:50pm, CB 335
007	Weaver	MWF 2:00pm-2:50pm, CB 337
010	Zeckner	TR 8:00am-9:15am, CB 335
013	Zeckner	TR 11:00am-12:15pm, CB 347

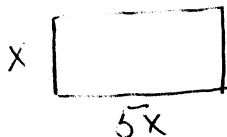
Multiple Choice Questions

Show all your work on the page where the question appears.
Clearly mark your answer both on the cover page on this exam
and in the corresponding questions that follow.

1. Write a formula, in terms of x , for the area, A , of a rectangle whose length is 5 times its width x .

Possibilities:

- (a) $A = 5x^2$
(b) $A = 12x$
(c) $A = x^2 + 25$
(d) $A = 25x^2$
(e) $A = x^2 + 5x$



$$A = x(5x)$$
$$A = 5x^2$$

2. Suppose that you walk at a constant rate of 5 feet per second. How many seconds do you have to walk to cover a distance of 4 miles? NOTE: 1 mile = 5280 feet

Possibilities:

- (a) 26400 seconds
(b) 6600 seconds
(c) 105600 seconds
(d) 264 seconds
(e) 4224 seconds

$$4 \text{ miles} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{\text{sec}}{5 \text{ ft}} = \frac{4 \times 5280}{5} \text{ sec}$$
$$= 4224 \text{ sec}$$

3. Simplify.

Possibilities:

- (a) $2x^{-36}$
(b) $8x^5$
(c) $8x^{-36}$
(d) $2x^5$
(e) $32x^5$

$$(8x^3)^3(4x)^{-4}$$
$$= 8^3 x^9 \cdot 4^{-4} x^{-4}$$
$$= \frac{8 \cdot 8 \cdot 8}{4 \cdot 4 \cdot 4 \cdot 4} x^9 x^{-4}$$
$$= 2x^5$$

4. Simplify.

$$\frac{x^2 - 9}{x^2 + x - 6}$$

Possibilities:

(a) $\frac{-9}{x-6}$

(b) $\frac{x-3}{x-2}$

(c) $\frac{x+3}{x-2}$

(d) $\frac{x+3}{x+2}$

(e) $\frac{-3}{x-2}$

$$= \frac{(x+3)(x-3)}{(x+3)(x-2)}$$

$$= \frac{x-3}{x-2}$$

$$\frac{x-3}{x-2}$$

5. If $A = \{2, 3, 5, 6\}$ and $B = \{3, 4, 5, 6\}$, then $A \cup B =$

Possibilities:

(a) $\{3, 5, 6\}$

(b) $\{2, 3, 5, 6\}$

(c) $\{3, 4, 5, 6\}$

(d) $\{2, 3, 4, 5, 6\}$

(e) None of the above.

$A \cup B$ contains everything that is in A and everything that is in B

$$A \cup B = \{2, 3, 4, 5, 6\}$$

6. Simplify the expression.

$$(4a - 3)(a + 2) - (1 - 2a)$$

Possibilities:

(a) $4a^2 + 3a - 7$

(b) $4a^2 + 7a - 7$

(c) $-8a - 6$

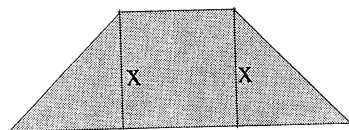
(d) $8a + 6$

(e) $-8a^3 - 6$

$$= 4a^2 + 8a - 3a - 6 - 1 + 2a$$

$$= 4a^2 + 7a - 7$$

7. Find the length x in the figure if the area of the shaded region is 50 square units.



$$\frac{1}{2}x \cdot x + x \cdot x + \frac{1}{2}x \cdot x = 50$$

$$\frac{1}{2}x^2 + x^2 + \frac{1}{2}x^2 = 50$$

$$2x^2 = 50$$

$$x^2 = 25$$

$$x = +5$$

$$x = -5$$

Does not make sense for this problem

Possibilities:

- (a) 8.3 units
- (b) 12.5 units
- (c) 25 units
- (d) 5 units
- (e) 7.3 units

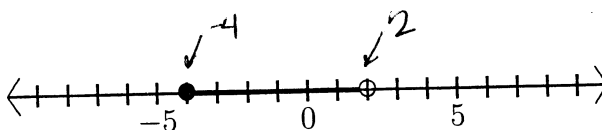
8. Write the radical expression $\sqrt[4]{7^3}$ using exponents.

Possibilities:

- (a) 7^1
- (b) $7^{\frac{4}{3}}$
- (c) $7^{\frac{3}{4}}$
- (d) 7^{12}
- (e) 7^7

$$7^{3/4}$$

9. Find the interval that corresponds to the graph.



Possibilities:

- (a) $[-4, 2)$
- (b) $(-4, 2]$
- (c) $[-4, 2]$
- (d) $(-4, 2)$
- (e) $[2, -4)$

$$[-4, 2)$$

$$10. \left(\frac{1}{5}\right)^4 5^6 = (5^{-1})^4 5^6 = 5^{-4} 5^6 = 5^{-4+6} = 5^2$$

Possibilities:

(a) 5^{-2}

(b) 5^{-24}

(c) 5^2

(d) 5^{10}

(e) 5^{24}

11. Simplify $\sqrt[3]{a^5 b^6}$

$$= \sqrt[3]{\underbrace{a \cdot a \cdot a}_{a^3} \cdot \underbrace{a \cdot a}_{a^2} \cdot \underbrace{b \cdot b \cdot b}_{b^3} \cdot \underbrace{b \cdot b \cdot b}_{b^3}}$$

$$= a \cdot b \cdot b \sqrt[3]{a \cdot a}$$

Possibilities:

(a) $a^2 b^3$

(b) $a^2 b^3 \sqrt[3]{b^2}$

(c) $ab \sqrt[3]{a^2}$

(d) $a^{15} b^{18}$

(e) $ab^2 \sqrt[3]{a^2}$

$$= ab^2 \sqrt[3]{a^2}$$

12. Simplify $(\sqrt{a} - \sqrt{b})(\sqrt{a} - \sqrt{b}) = \sqrt{a} \cdot \sqrt{a} - \sqrt{a} \sqrt{b} - \sqrt{b} \sqrt{a} + \sqrt{b} \sqrt{b}$

$$= a - \sqrt{ab} - \sqrt{ab} + b$$

$$= a - 2\sqrt{ab} + b$$

Possibilities:

(a) $a - b$

(b) $b - a$

(c) $a - 2\sqrt{ab} + b$

(d) $a^2 - b^2$

(e) $a - 2\sqrt{ab} - b$

13. Rationalize the denominator.

$$\frac{1}{4 + \sqrt{5}}$$

$$= \frac{1}{4 + \sqrt{5}} \left(\frac{4 - \sqrt{5}}{4 - \sqrt{5}} \right)$$

$$= \frac{4 - \sqrt{5}}{4^2 - (\sqrt{5})^2}$$

$$= \frac{4 - \sqrt{5}}{16 - 5} = \frac{4 - \sqrt{5}}{11}$$

Possibilities:

(a) $4 - \sqrt{5}$

(b) $\frac{4 - \sqrt{5}}{-1}$

(c) $4 + \sqrt{5}$

(d) $9(4 - \sqrt{5})$

(e) $\frac{4 - \sqrt{5}}{11}$

14. Find the degree of the polynomial $2x^5 + 6x^7 - 11 - 23x^2$.

Possibilities:

(a) 7

(b) 5

(c) 23

(d) 11

(e) 2

15. What quantity, q , of an 90% acid solution must be mixed with a 50% acid solution to produce 500 mL of a 60% acid solution.

	90% sol'n	50% sol'n	Mixture
Amt of solution (mL)	q	$500 - q$	500

Possibilities:

(a) 375 mL

(b) 125 mL

(c) 250 mL

(d) 450 mL

(e) 150 mL

Amt of acid	$.90q$	$.50(500 - q)$	$.60(500)$
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$$.90q + .50(500 - q) = .60(500)$$

$$.90q + 250 - .50q = 300$$

$$.40q = 50$$

$$q = 50 / .40 = 125 \text{ mL}$$

Short Answer Questions

Clearly write your answers in the Answer Box on the front page of this test.

16. Let S be the sum of six consecutive integers, the first being n . Find a formula for S in terms of n .

$$S = n + (n+1) + (n+2) + (n+3) + (n+4) + (n+5)$$

$$= 6n + 15$$

17. Factor $3x^2 - 2x - 5$.

$$(3x - 5)(x + 1)$$

18. Find all real solutions of the equation.

$$\frac{4}{x+5} = \frac{3}{x-1}$$

$$\cancel{(x+5)} \cancel{(x-1)} \frac{4}{\cancel{x+5}} = \frac{3}{\cancel{x-1}} (x+5)(x-1)$$

$$(x-1) \cdot 4 = 3(x+5)$$

$$4x - 4 = 3x + 15$$

$$x = 19$$

19. Find all real solutions of the equation.

$$3(x+1)^3 - 180 = 12$$

$$3(x+1)^3 = 192$$

$$(x+1)^3 = 64$$

$$x+1 = \sqrt[3]{64}$$

$$x+1 = 4$$

$$x = 3$$

20. Perform the indicated operation and simplify.

$$\frac{x}{x+2} - \frac{3}{x+1}$$

$$\frac{x}{x+2} \left(\frac{x+1}{x+1} \right) - \frac{3}{x+1} \left(\frac{x+2}{x+2} \right)$$

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

$$= \frac{x^2 + x - 3x - 6}{(x+2)(x+1)} = \frac{x^2 - 2x - 6}{x^2 + 3x + 2}$$