MATHEMATICS
Practice Placement Exam

Part I Pre-Algebra

1.   Evaluate: $16 \cdot 32 \cdot 53$.

2.   If 5 pieces of candy cost 75 cents, find the cost of 6 pieces of candy.

3.   Find the quotient and remainder when 133 is divided by 85.

4.   Find the sum: $\dfrac{2}{5} + \dfrac{1}{10}$

5.   Find the product : $\dfrac{5}{8} \cdot \dfrac{3}{10}$

6.   Find the difference: $\dfrac{1}{4} - \dfrac{1}{6}$

7.   10% of what number is 5?

8.   Find the quotient when 0.24 is divided by 0.8.

9.   Evaluate $5^3 \times 6^2$

10. $.0716 \times 48.2$

11.   Give the prime factorization of 180 in exponential form.

12.   Convert 3.3% to a decimal.

13.   Change 2.03 to a percent.

14.   Change 18% to a fraction in lowest terms.

15.   Compute the area of the circle with diameter 6 ft. to the nearest tenth.
   (Use 3.14 for pi)

Part II Elementary Algebra I

1. Evaluate the following: $- 5 + 4 - 3 - 6 + 9 - 3$

2. If $a = - 2$ and $b = 4$, $3a^2 - 5b + 6ab^2 = $ _____ .

3. Write an expression for 4 less than twice a number n.

4. Solve for w: $3w - 10 = 4w + 5$.

5. Solve for t: $6 - 2t > 18$

6. John can jog 4 miles in 56 minutes. At the same pace how far could he jog in 84 minutes?

7. Solve for x: $\dfrac{x}{3} + \dfrac{x}{4} = \dfrac{7}{6}$

8. Find the slope of the line containing the points $(-1, 3)$ and $(2, 4)$.

9. Find the y - intercept of the line y + 2x - 1 = 0.

10. Solve the system: $x + 3y = 13$ and $2x - y = -2$

11. Write in scientific notation: 53,000,000

12. Multiply: $(x + 5)(x - 7)$

13. Combine and simplify: $3x^2 - 2x - (x^2 - 5x)$.

14. Simplify: $\dfrac{a^3 b^5}{a^4 b^4}$

15. Simplify: $(x^2 yz^3)^2$

Part III Elementary Algebra II

1. Factor completely: $x^2 - 2x - 15$

2. Simplify: $\dfrac{x^2 + 6x + 8}{x^2 - 16}$

3. Solve the following for W: $P = 2L + 2W$

4. Divide and simplify: $\dfrac{x^2 + 6x + 5}{x^2 - 16} \div \dfrac{x^2 + 10x + 25}{x^2 + 8x + 16}$

5. Factor completely: $4x - 8x^2$

6. Add: $\dfrac{1}{x^2} + \dfrac{1}{y}$

7. Factor completely: $6x^2 - 7x - 3$

8. The difference between two numbers is 3. If four times the smaller is divided by the larger, the quotient is 5. Find the numbers.

9. Factor completely: $4x^2 - 25y^2$

10. Given the function: $f(x) = 3x^2 - 8$ find $f(2)$

11. Solve for x: $\sqrt{x + 3} + 2 = 8$

12. Simplify for $x \geq 0$: $\sqrt{50x^3}$

13. Find the vertex to the parabola defined by $y = x^2 - 6$

14. Put in standard form. Find b. $x^2 - 9 = 4x$

15. Solve for x: $x^2 - 4x + 2 = 0$

Part IV Intermediate Algebra and Trigonometry

For Problems 1 - 4 use the triangle below with $C = 90^0$, a = 5 cm and b = 12 cm.

1. Find c.

2. Find sin(A).

3. Find tan(B).
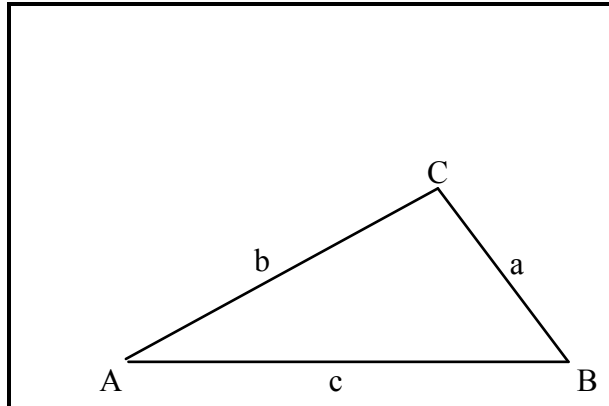
4. Find cos(C).

5. If $\sin(x) = -0.5$ and x is in the third quadrant, find x.

6. If $\tan(x) = 1$ and x is in the second quadrant, find x.

7. Simplify: $\dfrac{x^4 - 1}{x^2 - 1}$

8. The expression in #7 is not defined for which values of x?

9. Factor completely: $2x^3 + 16$.

10. Find the remainder when $x^2 + 6x + 3$ is divided by x − 1.

11. Given $y = x^2 + 3x - 4$, find the x-intercepts.

12. If f(x) = 4x − 1, find f(2x)

13. If $g(x) = x^2 - x$ find $g(x + h) - g(x)$.

14. In which quadrants does the solution set to $x + y > 6$ lie?

15. How many quarts of 30% salt solution should be added to 20 quarts of 50% salt solution in order to produce a 38% salt solution?

Part V Intermediate Algebra and Trigonometry II

1. Find the amplitude of the graph of $y = 3\sin(2x)$.

2. Find the period of the above function.

3. Without using tables evaluate: $\log_2 4 - 2\log_3 27 + \log_2 1$.

4. Find the domain of the function $y = \log_{10} x$

5. Solve for x: $\log_{10}(x - 3) + \log_{10} x = 1$

6. Perform the indicated operations and simplify to the form $a + bi$: $(1 + 3i)^2$.

7. Find the conjugate to $1 + 3i$.

8. Identify the following conic section: $x^2 - 4y^2 = 4$.

9. Find the domain to the function $f(x) = 2 - x^2$.

10. Find the range of the above function.

11. Find the inverse function to $y = 3x + 4$.

12. Evaluate $f(f^{-1}(x))$.

13. Find the sum of the first 20 terms of the sequence 126, 117, 108, ...

14. Find the sum of an infinite number of terms 9, 3, 1, ...

15. Find the second term of $(2x - 5)^5$ using the Binomial Theorem.

Answers

Part I

1.	27,136	2.	90 cents or $0.90	3.	1 r 48
4.	1/2	5.	3/16	6.	1/12
7.	50	8.	0.3	9.	4500
10.	3.45112	11.	$2^2 3^2 5$	12.	0.033
13.	203%	14.	9/50	15.	28.26 ft.

Part II

1.	-4	2.	-200	3.	$2n - 4$
4.	-15	5.	$t < -6$	6.	6 miles
7.	$x = 2$	8.	1/3	9.	(0, 1)
10.	(1, 4)	11.	5.3×10^7	12.	$x^2 - 2x - 35$
13.	$2x^2 + 3x$	14.	b/a	15.	$x^4 y^2 z^6$

Part III

1.	$(x - 5)(x + 3)$	2.	$\dfrac{x + 2}{x - 4}$	3.	$W = \dfrac{P - 2L}{2}$
4.	$\dfrac{(x + 1)(x + 4)}{(x - 4)(x + 5)}$	5.	$4x(1 - 2x)$	6.	$\dfrac{x^2 + y}{x^2 y}$
7.	$(3x + 2)(x - 3)$	8.	$-12, -15$	9.	$(2x + 5y)(2x - 5y)$
10.	4	11.	33	12.	$5x\sqrt{2x}$
13.	(0, –6)	14.	-4	15.	$2 \pm \sqrt{2}$

Part IV

1.	13 cm	2.	5/13	3.	12/5
4.	0	5.	210^0	6.	135^0
7.	$x^2 + 1$	8.	± 1	9.	$2(x + 2)(x^2 - 2x + 4)$
10.	10	11.	(–4, 0) and (1, 0)	12.	$8x - 1$
13.	$2xh + h^2 - h$	14.	I, II and IV	15.	30 qts.

Part V

1.	3	2.	π rad or 180^0	3.	-4
4.	$x > 0$	5.	5	6.	$-8 + 6i$
7.	$1 - 3i$	8.	hyperbola	9.	all reals

10. $y < 2$ or $y = 2$ 11. $\dfrac{x-4}{3}$ 12. x

13.   810   14.   27/2   15. $-400x^4$