

# Sample Documents

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**NY Regents Math (I–III)**  
(NY1)

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Algebra II  
New York Regents Practice

Name \_\_\_\_\_

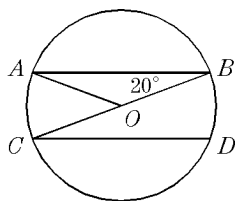
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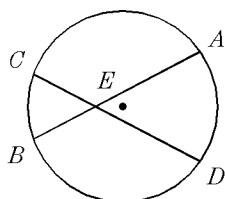
Score \_\_\_\_/\_\_\_\_

**Part I.** (No explicit directions.)

- Solve for  $x$ :  $\sqrt{3x-5} = 2$
- If the graph of the equation  $2x^2 - y^2 = 8$  passes through point  $(6, k)$ , find the positive value of  $k$ .
- In the accompanying diagram of circle  $O$ ,  $\overline{AB} \parallel \overline{CD}$ ,  $\overline{BC}$  is a diameter, and radius  $\overline{AO}$  is drawn. If  $m\angle ABC = 20$ , find  $m\widehat{BD}$ .



- Express  $4\sqrt{-144} - 3\sqrt{-49}$  as a monomial in terms of  $i$ .
- Solve for  $x$ :  $\frac{x+3}{2} + \frac{2x}{7} = 7$
- If  $f(x) = \cos x + \sin x$ , find the value of  $f(x)$  when  $x = \frac{3\pi}{2}$ .
- Express  $54^\circ$  in radian measure.
- Evaluate:  $\sum_{k=3}^6 \frac{2k+1}{2}$
- If  $f(x) = \frac{4}{|x|-2}$ , find all values of  $x$  for which  $f(x)$  is undefined.
- Evaluate:  $\csc(\arcsin \frac{\sqrt{3}}{2})$
- In the accompanying diagram, chords  $\overline{AB}$  and  $\overline{CD}$  intersect at  $E$ . If  $m\widehat{AD} = 70$  and  $m\widehat{BC} = 40$ , find  $m\angle AED$ .



- If  $5^{x^2-2x} = 1$ , find the positive value of  $x$ .
- In  $\triangle ABC$ ,  $a = 8$  and  $b = 8$ . If the area of  $\triangle ABC$  is 16, find  $m\angle C$ .
- If  $\sin \theta + \cos \theta = 1$  and  $\sin \theta - \cos \theta = 1$ , find the number of degrees in  $\theta$  in the interval  $0^\circ \leq \theta < 180^\circ$ .
- If  $A = -2 + 4i$  and  $B = 3 - 2i$ , in which quadrant does the graph of  $(A - B)$  lie?
- If  $f(x) = (x^0 + x^{\frac{1}{2}})^{-2}$ , find  $f(9)$ .
- Which polygon has rotational symmetry of  $90^\circ$ ?  
(1) equilateral triangle      (2) regular pentagon  
(3) square                      (4) regular hexagon
- The image of  $A(-1, 3)$  under the translation  $T_{2,1}$  is  
(1)  $(1, 4)$                       (2)  $(-3, 2)$   
(3)  $(-2, 3)$                       (4)  $(0, 5)$
- Which field property is illustrated by the expression  $\sin x(\cos x + 1) = \sin x \cos x + \sin x$ ?  
(1) associative property  
(2) commutative property  
(3) inverse property  
(4) distributive property of multiplication over addition
- The expression  $N = \frac{\sqrt[4]{x^2y}}{z}$  is equivalent to  
(1)  $\log N = \frac{1}{4}(2 \log x + \log y - \log z)$   
(2)  $\log N = \frac{1}{4}(2 \log x + \log y - \log z)$   
(3)  $\log N = \frac{1}{4} \log 2x + \frac{1}{4} \log y - \log z$   
(4)  $\log N = \frac{2}{4} \log x + \frac{1}{4} \log(y - z)$

21. If  $\cos A = \frac{4}{5}$  and  $A$  is in Quadrant I, what is the value of  $\sin A \cdot \tan A$ ?

- (1)  $\frac{9}{20}$       (2)  $\frac{12}{25}$       (3)  $\frac{16}{25}$       (4)  $\frac{16}{20}$

22. If the coordinates of point  $P$  are  $(-5, 9)$ , then  $(R_{30^\circ} \circ R_{45^\circ})(P)$  is equivalent to

- (1)  $(R_{20^\circ} \circ R_{25^\circ})(P)$       (2)  $(R_{-20^\circ} \circ R_{75^\circ})(P)$   
 (3)  $(R_{90^\circ} \circ R_{90^\circ})(P)$       (4)  $(R_{60^\circ} \circ R_{15^\circ})(P)$

23. If  $g(x) = \sqrt{x}$  and  $h(x) = x^3 - 1$ , what is  $g(h(4))$ ?

- (1) 5      (2) 7      (3)  $\sqrt{11}$       (4)  $\sqrt{63}$

24. Given: set  $A = \{(1, 2), (2, 3), (3, 4), (4, 5)\}$  If the inverse of the set is  $A^{-1}$ , which statement is true?

- (1)  $A$  and  $A^{-1}$  are functions.  
 (2)  $A$  and  $A^{-1}$  are not functions.  
 (3)  $A$  is a function and  $A^{-1}$  is not a function.  
 (4)  $A$  is not a function and  $A^{-1}$  is a function.

25. If  $\tan A < 0$  and  $\cos A > 0$ , in which quadrant does  $\angle A$  terminate?

- (1) I      (2) II      (3) III      (4) IV

26. The inequality  $-3 < x < 7$  is the solution of

- (1)  $|x - 2| > 5$       (2)  $|x - 2| < 5$   
 (3)  $|x + 2| > 5$       (4)  $|x + 2| < 5$

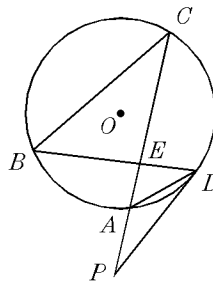
27. What is the period of the graph of the equation  $y = 2 \sin 4x$ ?

- (1)  $\frac{\pi}{2}$       (2)  $\pi$       (3)  $4\pi$       (4)  $8\pi$

## Part II. (No explicit directions.)

28. a) On the same set of axes, sketch and label the graphs of the equations  $y = \sin \frac{1}{2}x$  and  $y = 2 \cos x$  in the interval  $0 \leq x \leq 2\pi$ .  
 b) Use the graphs sketched in part a to determine the number of points in the interval  $0 \leq x \leq 2\pi$  that satisfy the equation  $\sin \frac{1}{2}x = 2 \cos x$ .

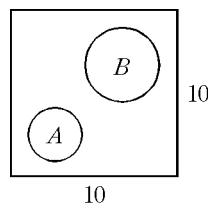
29. In the accompanying diagram,  $\overline{PD}$  is tangent to circle  $O$  at  $D$ ,  $\overline{PAC}$  is a secant, chords  $\overline{BD}$  and  $\overline{AC}$  intersect at  $E$ , chord  $\overline{AD}$  is drawn,  $m\widehat{BC} = m\widehat{CA}$ ,  $m\widehat{BC}$  is twice  $m\widehat{AB}$ , and  $m\angle DAC = 48$ .



Find:

- a)  $m\widehat{AB}$   
 b)  $m\widehat{AD}$   
 c)  $m\angle CPD$   
 d)  $m\angle CED$   
 e)  $m\angle ADP$

30. The sides of a square dart board have length 10. Circle  $A$ , with an area of 9, and circle  $B$ , with an area of 16, lie inside the square and do not overlap. [Assume that a dart has an equal probability of landing anywhere on the board.]



- a) Find the probability that a dart hits the board
- 1) inside circle  $A$
  - 2) inside circle  $B$
  - 3) outside both circles
- b) If a dart hits the board three times, find the probability that it lands outside both circles at most once.

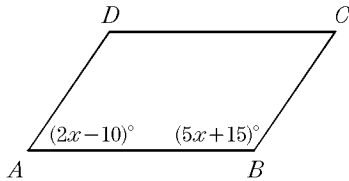
**Answer List**

- |                          |   |   |
|--------------------------|---|---|
| 1. 3                     | 2. 8  | 3. 40   |
| 4. $27i$                 | 5. 7  | 6. $-1$   |
| 7. $\frac{3\pi}{10}$     | 8. 20   | 9. $\pm 2$  |
| 10. $\frac{2}{\sqrt{3}}$ | 11. 55  | 12. 2   |
| 13. 30                   | 14. 90  | 15. II  |
| 16. $\frac{1}{16}$       | 17. 3   | 18. 1   |
| 19. 4                    | 20. 2   | 21. 1   |
| 22. 4                    | 23. 4   | 24. 1   |
| 25. 4                    | 26. 2   | 27. 1   |
| 28. (a) [graph]; (b) 2   | 29. (a) 72; (b) 48; (c) 24; (d) 84;<br>(e) 24 | 30. (a) (1) $\frac{9}{100}$ , (2) $\frac{16}{100}$ or $\frac{4}{25}$ ,<br>(3) $\frac{75}{100}$ or $\frac{3}{4}$ ; (b) $\frac{10}{64}$ or $\frac{5}{32}$ |
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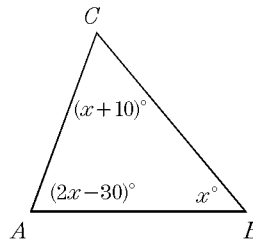
**Catalog List**

- |                |                |                |
|----------------|----------------|----------------|
| 1. NY1 GA 124  | 2. NY1 GA 125  | 3. NY1 GC 52   |
| 4. NY1 GB 26   | 5. NY1 GA 126  | 6. NY1 GE 121  |
| 7. NY1 GE 122  | 8. NY1 GF 24   | 9. NY1 GA 127  |
| 10. NY1 GE 123 | 11. NY1 GC 53  | 12. NY1 GA 128 |
| 13. NY1 GE 124 | 14. NY1 GE 125 | 15. NY1 GC 54  |
| 16. NY1 GC 55  | 17. NY1 HD 53  | 18. NY1 HD 54  |
| 19. NY1 HE 170 | 20. NY1 HA 186 | 21. NY1 HE 171 |
| 22. NY1 HD 55  | 23. NY1 HA 187 | 24. NY1 HA 188 |
| 25. NY1 HE 172 | 26. NY1 HA 189 | 27. NY1 HE 173 |
| 28. NY1 IE 54  | 29. NY1 IC 26  | 30. NY1 IF 30  |

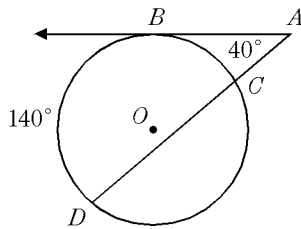
1. In the accompanying diagram of parallelogram  $ABCD$ ,  $m\angle A = 2x - 10$  and  $m\angle B = 5x + 15$ . Find  $x$ .



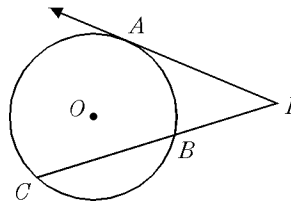
2. In the accompanying diagram,  $m\angle A = 2x - 30$ ,  $m\angle B = x$ , and  $m\angle C = x + 10$ . Find the number of degrees in  $\angle B$ .



3. In triangle  $ABC$ ,  $m\angle A = 80$  and  $AB > AC$ . What is the *smallest* angle of triangle  $ABC$ ?
5. In the accompanying diagram,  $\overrightarrow{AB}$  is tangent to circle  $O$  at  $B$  and  $\overline{ACD}$  is a secant. If  $m\angle A = 40$  and  $m\widehat{BD} = 140$ , find  $m\widehat{BC}$ .



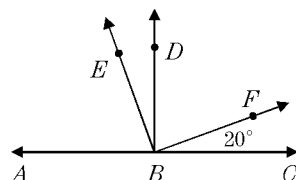
4. In parallelogram  $ABCD$ ,  $m\angle A = 5x - 20$  and  $m\angle C = 3x + 40$ . Find the value of  $x$ .
6. In the accompanying diagram,  $\overrightarrow{PA}$  is tangent to circle  $O$  at  $A$  and  $\overline{PBC}$  is a secant. If  $\widehat{AB} : \widehat{BC} : \widehat{CA} = 2 : 3 : 4$ , find  $m\angle P$ .



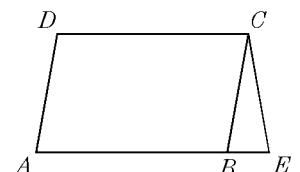
7. Which set of numbers can *not* represent the lengths of the sides of a triangle?
- (a)  $\{6, 8, 11\}$                       (b)  $\{7, 5, 6\}$   
 (c)  $\{7, 18, 11\}$                     (d)  $\{9, 12, 19\}$

8. Which set of numbers represents the lengths of the sides of a right triangle?
- (a)  $\{2, 6, \sqrt{40}\}$                       (b)  $\{2, 18, 20\}$   
 (c)  $\{4, 6, \sqrt{40}\}$                       (d)  $\{4, 36, 40\}$

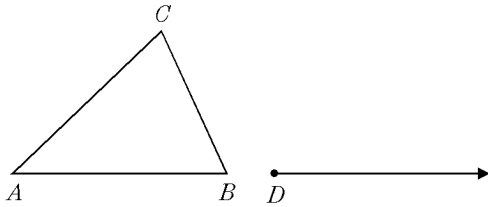
9. In the accompanying diagram,  $\overrightarrow{BD} \perp \overline{ABC}$  at  $B$  and  $\overline{BE} \perp \overline{BF}$  at  $B$ . If  $m\angle FBC = 20$ , what is  $m\angle EBD$ ?
- (a) 20      (b) 70  
 (c) 90      (d) 110



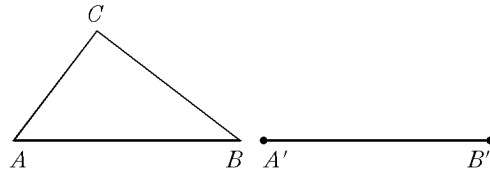
10. In the accompanying diagram of parallelogram  $ABCD$ ,  $\overline{AB}$  is extended to  $E$  such that  $\overline{CB} \cong \overline{CE}$ . If  $m\angle ADC = 100$ , what is  $m\angle CEB$ ?
- (a) 100      (b) 80  
 (c) 50      (d) 40



11. Using point  $D$  as the vertex, construct an angle congruent to angle  $CAB$  of triangle  $ABC$ .

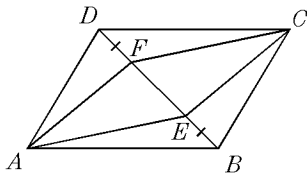


12. Using compass and straightedge, construct a triangle congruent to triangle  $ABC$ . Use  $\overline{A'B'}$  as one side of the congruent triangle.



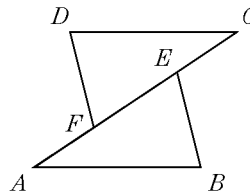
13. Given: parallelogram  $ABCD$ ,  $\overline{DFEB}$ , and  $\overline{DF} \cong \overline{BE}$ .

Prove:  $AECF$  is a parallelogram.



14. Given:  $\overline{AFEC}$ ,  $\angle D \cong \angle B$ ,  $\overline{AF} \cong \overline{CE}$ , and  $\overline{DC} \parallel \overline{AB}$ .

Prove:  $\overline{DF} \cong \overline{EB}$



15. Complete the truth table for the statement.  $\sim(p \rightarrow q) \leftrightarrow (p \wedge \sim q)$ .

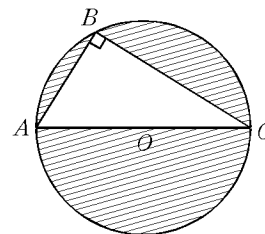
a)

$p$	$q$	$p \rightarrow q$	$\sim(p \rightarrow q)$	$\sim q$	$p \wedge \sim q$	$\sim(p \rightarrow q) \leftrightarrow (p \wedge \sim q)$
T	T					
T	F					
F	T					
F	F					

b) Is the statement  $\sim(p \rightarrow q) \leftrightarrow (p \wedge \sim q)$  a tautology?

c) Justify the answer in part b.

16. In the accompanying diagram, right triangle  $ABC$  with the right angle at  $B$  is inscribed in circle  $O$ ,  $AC$  is a diameter.  $BC = 12$  centimeters, and  $AB = 9$  centimeters. Find the area of the shaded region to the nearest square centimeter.



**Answer List**

- |                        |                    |  |
|------------------------|--------------------|--|
| 1. 25                  | 2. 50              | 3. $\angle ABC$  |
| 4. 30                  | 5. 60              | 6. 40  |
| 7. c                   | 8. a               | 9. a   |
| 10. b                  | 11. [construction] | 12. [construction]   |
| 13. [proof]            | 14. [proof]        | 15. (a) last column: (T, T, T, T);<br>(b) yes; (c) [answers will vary] |
| 16. $123 \text{ cm}^2$ |                    |  |
- 

**Catalog List**

- |               |               |               |
|---------------|---------------|---------------|
| 1. NY1 AD 80  | 2. NY1 AD 88  | 3. NY1 DB 5   |
| 4. NY1 DB 9   | 5. NY1 GC 40  | 6. NY1 GC 43  |
| 7. NY1 EB 2   | 8. NY1 EB 9   | 9. NY1 EB 13  |
| 10. NY1 EB 42 | 11. NY1 CA 7  | 12. NY1 CA 15 |
| 13. NY1 FA 31 | 14. NY1 FA 52 | 15. NY1 CD 21 |
| 16. NY1 CA 99 |               |               |

## Week of December 6–11

### Monday

**Reading:**

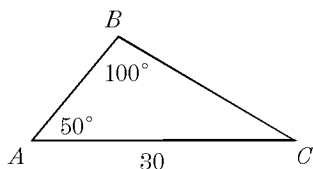
Pgs. 465–467

**Homework:**

Pg. 468—1–35 odd; 40, 41, 42

**Extra Credit:**

In the accompanying diagram of  $\triangle ABC$ ,  $AC = 30$  centimeters,  $m\angle B = 100^\circ$ , and  $m\angle A = 50^\circ$ . Find the area of  $\triangle ABC$  to the nearest square centimeter. [Show or explain the procedure used to obtain your answer.]



### Tuesday

**Reading:**

Pgs. 472–475

**Homework:**

Pg. 475—1–31 odd; 33–36 all

**Extra Credit:**

Find, to the nearest degree, all values of  $x$  in the interval  $0^\circ \leq x < 360^\circ$  that satisfy the equation  $3 + \tan^2 x = 5 \tan x$ . [Show or explain the procedure used to obtain your answer.]

### Wednesday

**Reading:**

Pgs. 479–481

**Homework:**

Pg. 482—1–12 all; 13, 14, 19, 20

**Extra Credit:**

- Sketch the graph of  $y = 3 \sin 2x$  in the interval  $-\pi \leq x \leq \pi$ .
- For all values of  $\theta$  for which the expressions are defined, prove the following is an identity:

$$\frac{\cos(90^\circ - \theta)}{\sin 2\theta} = \frac{\sec \theta}{2}$$

### Thursday

**Reading:**

Pgs. 486–488

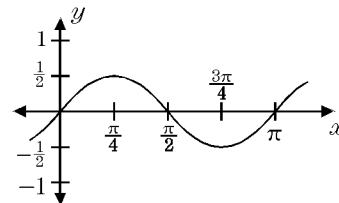
**Homework:**

Pg. 489—1–23 odd; 24–30 even

**Extra Credit:**

Which equation is represented by the graph below?

- $y = 2 \sin \frac{1}{2}x$
- $y = \frac{1}{2} \sin \frac{1}{2}x$
- $y = \frac{1}{2} \sin 2x$
- $y = -\frac{1}{2} \cos 2x$



### Friday

**Reading:**

Pgs. 492–494

**Homework:**

Pg. 495—1–20 all

**Extra Credit:**

Two forces of 42 pounds and 65 pounds act on a body at an acute angle with each other. The angle between the resultant force and the 42-pound force is  $38^\circ$ . Find, to the nearest degree, the angle formed by the 42-pound and the 65-pound forces. [Show or explain the procedure used to obtain your answer.]

### Saturday

**Reading:**

Chapter 9 Summary (Pg. 498)

**Extra Credit:**

- Prove that the following is an identity:  

$$\frac{\cos 2\theta}{\sin \theta} + \sin \theta = \frac{1}{\sin \theta} - \sin \theta$$
- Diameter  $\overline{CB}$  of circle  $O$  is extended to point  $P$ ,  $\overline{PA}$  is tangent to the circle at  $A$ , and chords  $\overline{AB}$  and  $\overline{AC}$  are drawn. Prove that  $\angle PAB \cong \angle ACB$ .

