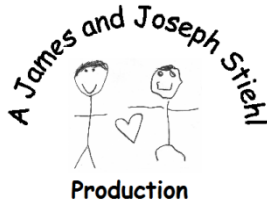


JD'S REGENTS PREPARATION, LLC.

-Presents-

**ALGEBRA 2 WITH
TRIGONOMETRY
REGENTS EXAM
REVIEW MANUAL**

**WITH 6 REGENTS EXAMS,
5 TOPICALLY ORGANIZED**



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Algebra 2

with Trigonometry

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Exponents and Radicals

June 2013

Question(s): 14, 24, 25

- 14 If n is a negative integer, then which statement is always true?

1) $6n^{-2} < 4n^{-1}$

3) $6n^{-1} < 4n^{-1}$

2) $\frac{n}{4} > -6n^{-1}$

4) $4n^{-1} > (6n)$

- 24 Which expression is equivalent to $? \frac{2x^{-2}y^{-2}}{4y^{-5}} ?$

1) $\frac{y^3}{2x^2}$

3) $\frac{2x^2}{y^3}$

2) $\frac{2y^3}{x^2}$

4) $\frac{x^2}{2y^3}$

- 25 Expressed with a rational denominator and in simplest form, $\frac{x}{x-\sqrt{x}}$ is

1) $\frac{x^2 + x\sqrt{x}}{x^2 - x}$

3) $\frac{x + \sqrt{x}}{1 - x}$

2) $-\sqrt{x}$

4) $\frac{x + \sqrt{x}}{x - 1}$

- 16 The expression $\frac{4}{5 - \sqrt{13}}$ is equivalent to
- 1) $\frac{4\sqrt{13}}{5\sqrt{13} - 13}$ 3) $\frac{5 + \sqrt{13}}{3}$
- 2) $\frac{4(5 - \sqrt{13})}{38}$ 4) $\frac{4(5 + \sqrt{13})}{38}$
- 20 If $r = \sqrt[3]{\frac{A^2B}{C}}$, then $\log r$ can be represented by
- 1) $\frac{1}{6} \log A + \frac{1}{3} \log B - \log C$
- 3) $\frac{1}{3} \log(A^2 + B) - C$
- 2) $3(\log A^2 + \log B - \log C)$
- 4) $\frac{2}{3} \log A + \frac{1}{3} \log B - \frac{1}{3} \log C$
- 21 The solution set of $\sqrt{3x + 16} = x + 2$ is
- 1) $\{-3, 4\}$ 3) $\{3\}$
- 2) $\{-4, 3\}$ 4) $\{-4\}$
- 34 Simplify the expression $\frac{3x^{-4}y^5}{(2x^3y^{-7})^{-2}}$ and write the answer using only positive exponents.

August 2010

Question(s): 11, 19

11 When simplified, the expression $\left(\frac{w^{-5}}{w^{-9}}\right)^{\frac{1}{2}}$ is equivalent to

1) w^{-7}

3) w^7

2) w^2

4) w^{14}

19 The fraction $\frac{3}{\sqrt{3a^2b}}$ is equivalent to

1) $\frac{1}{a\sqrt{b}}$

3) $\frac{\sqrt{3b}}{ab}$

2) $\frac{\sqrt{b}}{ab}$

4) $\frac{\sqrt{3}}{a}$

June 2010

Question(s): 3, 11, 12, 18, 32

3 If $a = 3$ and $b = -2$, what is the value of the expression $\frac{a^{-2}}{b^{-3}}$?

1) $-\frac{9}{8}$

3) $-\frac{8}{9}$

2) -1

4) $\frac{8}{9}$

11 The expression $(x^2 - 1)^{-\frac{2}{3}}$ is equivalent to

1) $\sqrt[3]{(x^2 - 1)^2}$

3) $\sqrt{(x^2 - 1)^3}$

2) $\frac{1}{\sqrt[3]{(x^2 - 1)^2}}$

4) $\frac{1}{\sqrt{(x^2 - 1)^3}}$

12 Which expression is equivalent to $\frac{\sqrt{3} + 5}{\sqrt{3} - 5}$?

1) $-\frac{14 + 5\sqrt{3}}{11}$

3) $\frac{14 + 5\sqrt{3}}{14}$

2) $-\frac{17 + 5\sqrt{3}}{11}$

4) $\frac{17 + 5\sqrt{3}}{14}$

18. The solution set of the equation $\sqrt{x+3} = 3-x$ is

1) $\{1\}$

3) $\{1, 6\}$

2) $\{0\}$

4) $\{2, 3\}$

32 Express $5\sqrt{3x^3} - 2\sqrt{27x^3}$ in simplest radical form.

Complex Number

June 2013

Question: 19

- 19 If $x = 3i$, $y = 2i$, and $z = m + i$, the expression xy^2z equals

- | | |
|-----------------|----------------|
| 1) $-12 - 12mi$ | 3) $12 - 12mi$ |
| 2) $-6 - 6mi$ | 4) $6 - 6mi$ |

June 2012

Question(s): 19, 28

- 19 The conjugate of the complex expression $-5x + 4i$ is

- | | |
|--------------|---------------|
| 1) $5x - 4i$ | 3) $-5x - 4i$ |
| 2) $5x + 4i$ | 4) $-5x + 4i$ |

- 28 Determine the value of n in simplest form:

$$i^{13} + i^{18} + i^{31} + n = 0$$

June 2011

Question(s): None

August 2010

Question(s): 1, 4, 24

- 1 The product of $(3 + \sqrt{5})$ and $(3 - \sqrt{5})$ is
- | | |
|---------------------|-------|
| 1) $4 - 6\sqrt{5}$ | 3) 14 |
| 2) $14 - 6\sqrt{5}$ | 4) 4 |
- 4 The expression $2i^2 + 3i^3$ is equivalent to
- | | |
|--------------|--------------|
| 1) $-2 - 3i$ | 3) $-2 + 3i$ |
| 2) $2 - 3i$ | 4) $2 + 3i$ |
- 24 What is the conjugate of $-2 + 3i$?
- | | |
|--------------|-------------|
| 1) $-3 + 2i$ | 3) $2 - 3i$ |
| 2) $-2 - 3i$ | 4) $3 + 2i$ |

June 2010

Question(s): 6, 19

6 In simplest form, $\sqrt{-300}$ is equivalent to

1) $3i\sqrt{10}$

3) $10i\sqrt{3}$

2) $5i\sqrt{12}$

4) $12i\sqrt{5}$

19 The solutions of the equation $y^2 - 3y = 9$ are

1) $\frac{3 \pm 3i\sqrt{3}}{2}$

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

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

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

Quadratics

June 2013

Question(s): 12, 28, 36, 39

- 12 Which ordered pair is in the solution set of the system of equations shown below?

$$y^2 - x^2 + 32 = 0$$

$$3y - x = 0$$

- | | |
|----------|------------|
| 1) (2,6) | 3) (-1,-3) |
| 2) (3,1) | 4) (-6,-2) |
- 28 Determine the sum and the product of the roots of the equation $12x^2 + x - 6 = 0$.
- 36 Solve the equation below algebraically, and express the result in simplest radical form:

$$\frac{13}{x} = 10 - x$$

- 39 Solve algebraically for all values of x :

$$x^4 + 4x^3 + 4x^2 = -16x$$

June 2012

Question(s): 1, 8, 14, 15, 22

- 1 What is the product of $\left(\frac{2}{5}x - \frac{3}{4}y^2\right)$ and $\left(\frac{2}{5}x + \frac{3}{4}y^2\right)$?
- 1) $\frac{4}{25}x^2 - \frac{9}{16}y^4$ 3) $\frac{2}{5}x^2 - \frac{3}{4}y^4$
- 2) $\frac{4}{25}x - \frac{9}{16}y^2$ 4) $\frac{4}{5}x$
- 8 Which equation has roots with the sum equal to $\frac{9}{4}$
and the product equal to $\frac{3}{4}$?
- 1) $4x^2 + 9x + 3 = 0$ 3) $4x^2 - 9x + 3 = 0$
- 2) $4x^2 + 9x - 3 = 0$ 4) $4x^2 - 9x - 3 = 0$
- 14 When factored completely, $x^3 + 3x^2 - 4x - 12$ equals
- 1) $(x+2)(x-2)(x-3)$ 3) $(x^2-4)(x+3)$
- 2) $(x+2)(x-2)(x+3)$ 4) $(x^2-4)(x-3)$

15 What is the middle term in the expansion of

$$\left(\frac{x}{2} - 2y\right)^6 ?$$

1) $20x^3y^3$

3) $-20x^3y^3$

2) $-\frac{15}{4}x^4y^2$

4) $\frac{15}{4}x^4y^2$

22 How many negative solutions to the equation

$$2x^3 - 4x^2 + 3x - 1 = 0$$
 exist?

1) 1

3) 3

2) 2

4) 0

June 2011

Question(s): 22, 26, 28, 30, 33, 39

22 Brian correctly used a method of completing the square to solve the equation $x^2 + 7x - 11 = 0$. Brian's first step was to rewrite the equation as $x^2 + 7x = 11$. He then added a number to both sides of the equation. Which number did he add?

1) $\frac{7}{2}$

3) $\frac{49}{2}$

2) $\frac{49}{4}$

4) 49

- 26 What is the coefficient of the fourth term in the expansion of $(a - 4b)^9$?
- 1) $-5,376$ 3) 336
2) -336 4) 5,376
- 28 Express the product of $\left(\frac{1}{2}y^2 - \frac{1}{3}y\right)$ and $\left(12y + \frac{3}{5}\right)$ as a trinomial.
- 30 Write a quadratic equation such that the sum of its roots is 6 and the product of its roots is -27 .
- 33 Factor the expression $12t^8 - 75t^4$ completely.
- 39 Solve the following systems of equations algebraically:

$$5 = y - x$$
$$4x^2 = -17x + y + 4$$

August 2010

Question(s): 9, 15, 16, 23, 28, 34

- 9 The roots of the equation $2x^2 + 7x - 3 = 0$ are
- 1) $-\frac{1}{2}$ and -3 3) $\frac{-7 \pm \sqrt{73}}{4}$
2) $\frac{1}{2}$ and 3 4) $\frac{7 \pm \sqrt{73}}{4}$

- 15 Which values of x are in the solution set of the following system of equations?

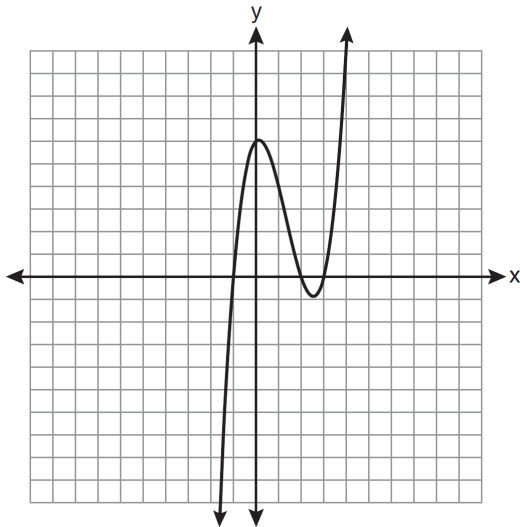
$$y = 3x - 6$$

$$y = x^2 - x - 6$$

- 1) 0, -4
2) 0, 4
3) 6, -2
4) -6, 2
- 16 The roots of the equation $9x^2 + 3x - 4 = 0$ are

- 1) imaginary
2) real, rational, and equal
3) real, rational, and unequal
4) real, irrational, and unequal

23 The graph of $y = x^3 - 4x^2 + x + 6$ is shown below.



What is the product of the roots of the equation $x^3 - 4x^2 + x + 6 = 0$?

1) -36

3) 6

2) -6

4) 4

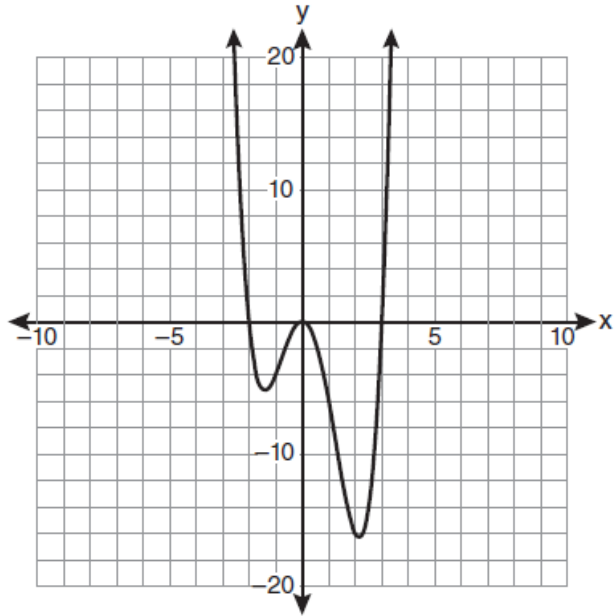
28 Factor completely: $10ax^2 - 23ax - 5a$

34 Express $\left(\frac{2}{3}x - 1\right)^2$ as a trinomial.

June 2010

Question(s): 5, 8, 9, 17, 28, 30

- 5 The graph of $y = f(x)$ is shown below.



Which set lists all the real solutions of $f(x) = 0$?

- | | |
|----------------|-------------------|
| 1) $\{-3, 2\}$ | 3) $\{-3, 0, 2\}$ |
| 2) $\{-2, 3\}$ | 4) $\{-2, 0, 3\}$ |

8 Factored completely, the expression $12x^4 + 10x^3 - 12x^2$ is equivalent to

1) $x^2(4x+6)(3x-2)$

2) $2(2x^2+3x)(3x^2-2x)$

3) $2x^2(2x-3)(3x+2)$

4) $2x^2(2x+3)(3x-2)$

9 The solutions of the equation $y^2 - 3y = 9$ are

1) $\frac{3 \pm 3i\sqrt{3}}{2}$

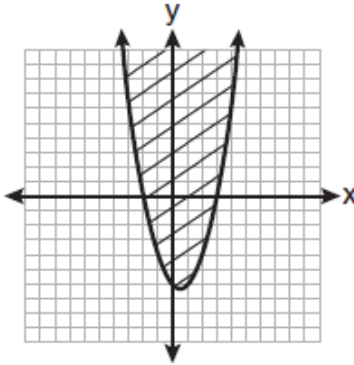
3) $\frac{-3 \pm 3\sqrt{5}}{2}$

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

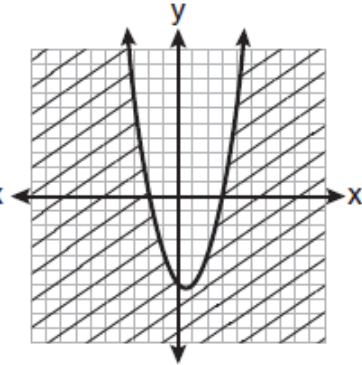
4) $\frac{3 \pm 3\sqrt{5}}{2}$

17 Which graph best represents the inequality
 $y + 6 \geq x^2 - x$?

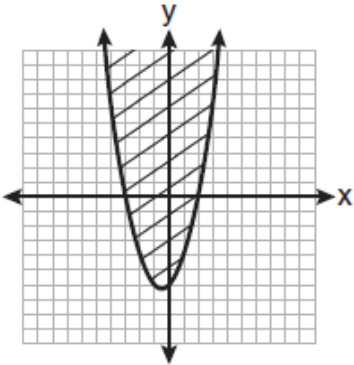
1)



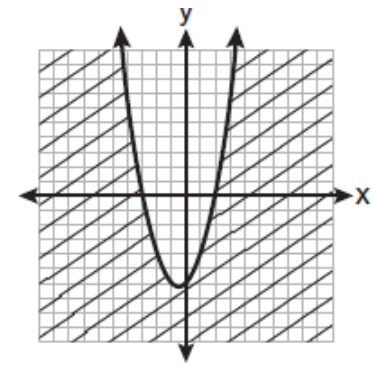
3)



2)



4)



28 Use the discriminant to determine all values of k that would result in the equation $x^2 - kx + 4 = 0$ having equal roots.

30 Find the sum and product of the roots of the equation $5x^2 + 11x - 3 = 0$.

Rational Values

June 2013

Question(s): 5

5 The simplest form of $\frac{1 - \frac{4}{x}}{1 - \frac{2}{x} - \frac{8}{x^2}}$ is

1) $\frac{1}{2}$

3) $\frac{x}{3}$

2) $\frac{x}{x+2}$

4) $-\frac{x}{x-2}$

June 2012

Question(s): 36

36 Express in simplest form: $\frac{\frac{4 - x^2}{x^2 + 7x + 12}}{\frac{2x - 4}{x + 3}}$

June 2011

Question(s): None

August 2010

Questions 18, 36

18 When $x^{-1} - 1$ is divided by $x - 1$, the quotient is

1) -1

3) $\frac{1}{x^2}$

2) $-\frac{1}{x}$

4) $\frac{1}{(x-1)^2}$

36 Solve algebraically for x : $\frac{1}{x+3} - \frac{2}{3-x} = \frac{4}{x^2-9}$

June 2010

Question(s): 35

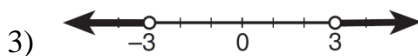
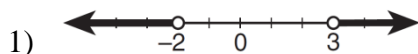
35 Express in simplest form: $\frac{\frac{1}{2} - \frac{4}{d}}{\frac{1}{d} + \frac{3}{2d}}$

Absolute Values, Inequalities

June 2013

Question(s): 7

7 What is the graph of the solution set of $|2x - 1| > 5$?

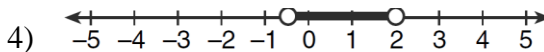
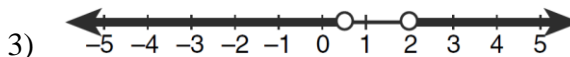
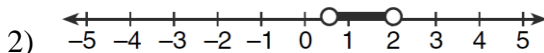
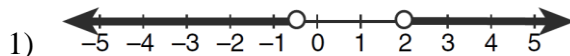


June 2012

Question(s): 9

9 Which graph represents the solution set of

$$\left| \frac{4x - 5}{3} \right| > 1?$$



June 2011

Question(s): 37

- 37 Graph the inequality $-3|6 - x| < -15$ for x . Graph the solution on the line below.



August 2010

Question(s): None

June 2010

Question(s): None