

Math 1010 Final Exam
Form A, Fall 2010

Name: _____

Instructor: _____

ID verification: _____

Each problem is equally weighted. Scientific calculators are permitted.

Time limit: Two hours.

Not allowed: notes, books, graphing/programable calculators, cell phones, handhelds, headphones.

1) **Solve.**

$$\frac{1}{x+6} + \frac{4}{x+5} = \frac{-1}{x^2 + 11x + 30}$$

A) No solution

B) 0

C) 5

D) -6

2) **Solve.**

A lot is in the shape of a right triangle. The shorter leg measures 60 meters. The hypotenuse is 20 meters longer than the length of the longer leg. How long is the longer leg?

A) 60 meters

B) 100 meters

C) 80 meters

D) 120 meters

3) **Perform the indicated operation and simplify. Write the answer in the form $a + bi$.**

$$\frac{-2i}{4 - 2i}$$

A) $-\frac{1}{3} - \frac{2}{3}i$

B) $-\frac{1}{5} - \frac{2}{5}i$

C) $\frac{1}{5} - \frac{10}{37}i$

D) $\frac{1}{3} - \frac{2}{3}i$

E) $\frac{1}{5} - \frac{2}{5}i$

4) **Solve the problem. If necessary, round to the nearest tenth.**

The length of a rectangle is 2 inches more than four times its width. The area of the rectangle is 72 square inches. Find the dimensions of the rectangle.

A) 5.1 in. by 14.2 in.

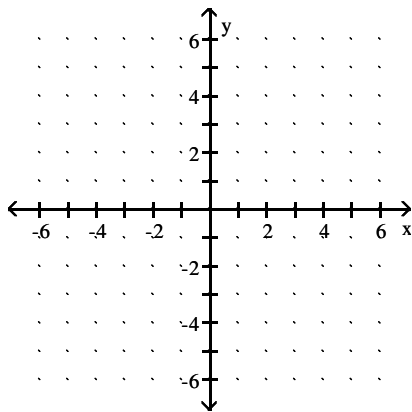
B) 4.0 in. by 18.0 in.

C) 8.0 in. by 9.0 in.

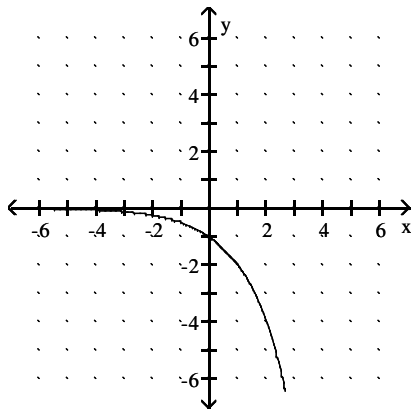
D) 6.8 in. by 29.2 in.

5) **Graph.**

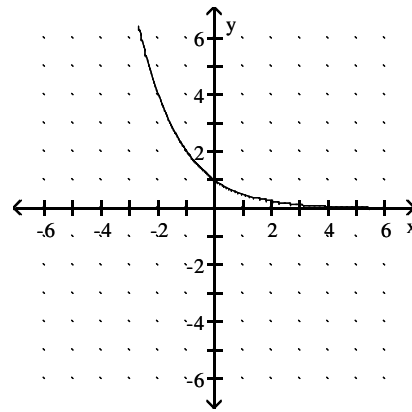
$$y = 2^x$$



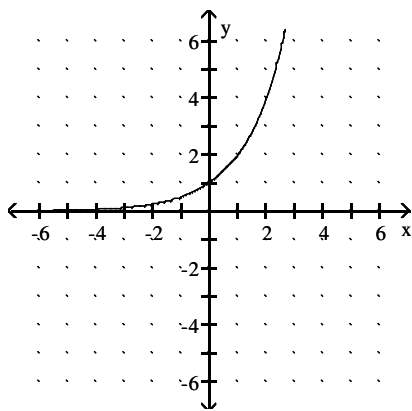
A)



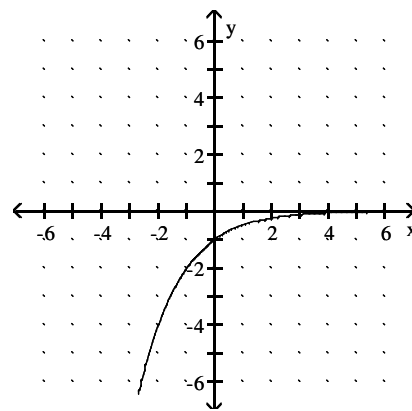
B)



C)



D)



6) Find the function value.

Find $f(-4)$ when $f(x) = x^2 + 4x - 1$.

A) -1

B) -9

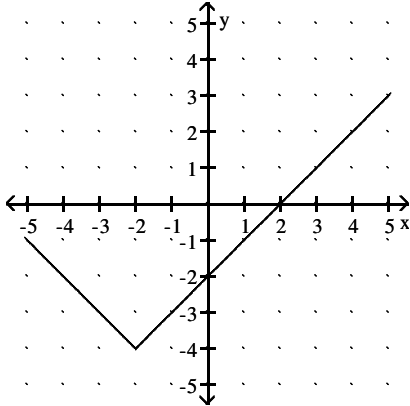
C) 1

D) -33

E) 29

7) The graph of a function f is provided. Determine the requested function's value.

$f(1)$



A) 3

B) -3

C) 1

D) -1

8) Find the center and the radius of the circle.

$$x^2 + y^2 + 6x + 14y + 9 = 0$$

A) $(-7, -3)$; $r = 7$

B) $(3, 7)$; $r = 49$

C) $(-3, -7)$; $r = 7$

D) $(7, 3)$; $r = 49$

9) Add or subtract. Simplify by combining like radical terms, if possible. Assume all variables and radicands represent nonnegative numbers.

$$\sqrt{2a} - 5\sqrt{18a} - 6\sqrt{72a}$$

A) $-50\sqrt{2a}$

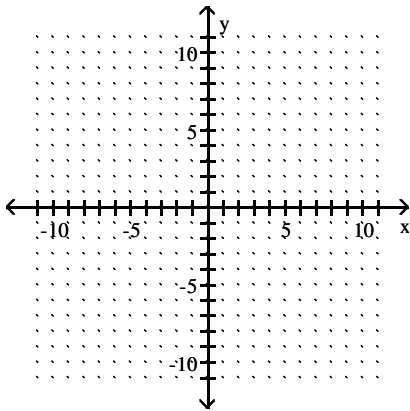
B) $-50\sqrt{92a}$

C) $-11\sqrt{2a}$

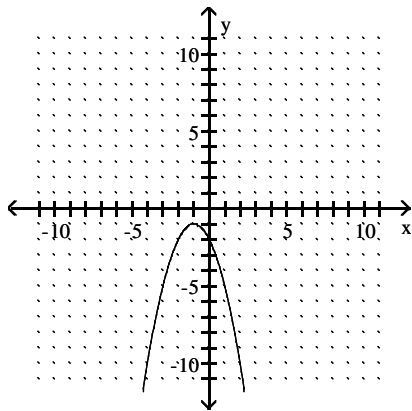
D) $-11\sqrt{92a}$

10) Graph.

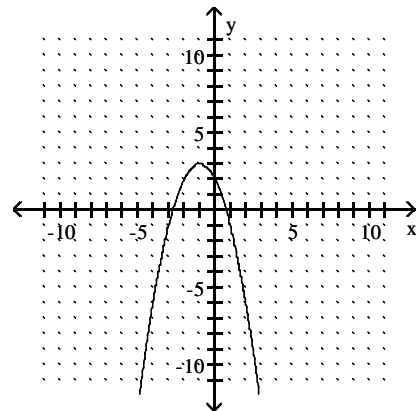
$$f(x) = -x^2 - 2x - 2$$



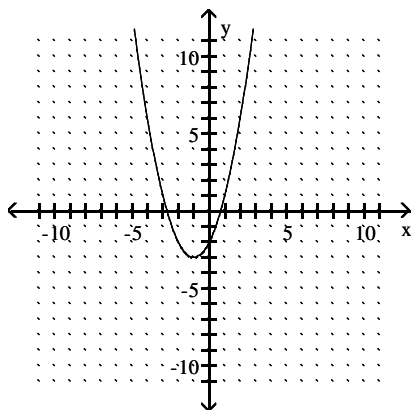
A)



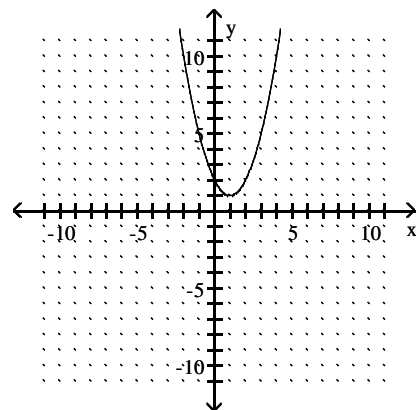
B)



C)



D)



11) Solve using the elimination method. If the system has no solution, state this.

$$7x - 5y = 20$$

$$-3x + 3y = -12$$

A) (-1, -3)

B) No solution

C) (0, -4)

D) (0, -3)

- 12) Use the laws of exponents to simplify. Do not use negative exponents in the answer. Assume that even roots are of nonnegative quantities and that all denominators are nonzero.

$$(x^{2/3} y^{-4/5})^{1/2}$$

A) $\frac{x^{1/3}}{y^{2/5}}$

B) $\frac{x^{7/6}}{y^{3/10}}$

C) $\frac{x^{2/3}}{y^{2/5}}$

D) $-x^{1/3}y^{2/5}$

- 13) Find an equation of the line containing the given pair of points. Write your final answer as a linear function in slope-intercept form.

$(-5, -1)$ and $(2, -7)$

A) $f(x) = \frac{6}{7}x - \frac{37}{7}$

B) $f(x) = -\frac{4}{7}x - \frac{37}{7}$

C) $f(x) = -\frac{6}{7}x - \frac{37}{7}$

D) $f(x) = -\frac{6}{7}x + 3$

- 14) Solve.

$$7m^2 + 10m + 2 = 0$$

A) $\frac{-5 \pm \sqrt{11}}{7}$

B) $\frac{-5 \pm \sqrt{39}}{7}$

C) $\frac{-5 \pm 2\sqrt{11}}{7}$

D) $\frac{-5 \pm \sqrt{11}}{14}$

E) $\frac{-10 \pm \sqrt{11}}{7}$

- 15) Divide.

$$(25x^3 + 5x^2 - 7x + 15) \div (5x - 3)$$

A) $5x^2 + 4x + 1 + \frac{21}{5x - 3}$

B) $5x^2 + 4x + 1$

C) $5x^2 + 4x + 1 + \frac{18}{5x - 3}$

D) $x^2 + 1 + \frac{4}{5x - 3}$

16) Rewrite as an equivalent logarithmic equation. Do not solve.

$$y^z = 2$$

A) $y = \log_z 2$

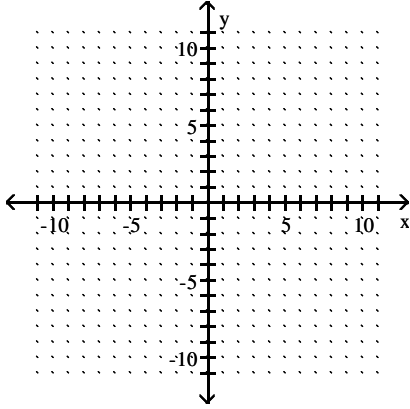
B) $z = \log_y 2$

C) $2 = \log_y z$

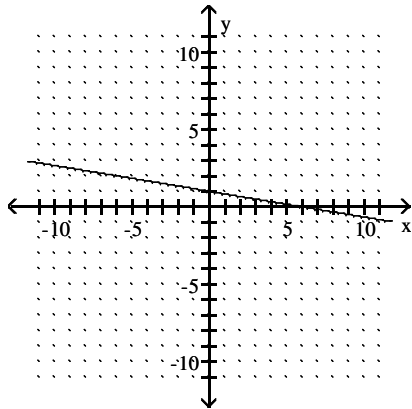
D) $z = \log_2 y$

17) Find the y- and x-intercepts for the equation. Then graph the equation.

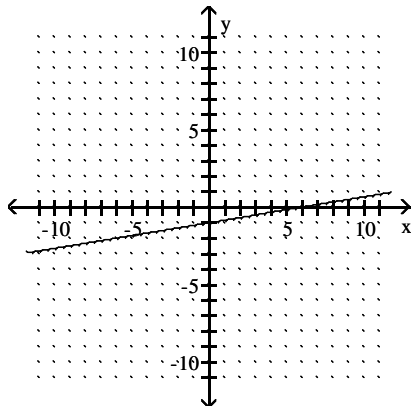
$$-6x - 36y = 36$$



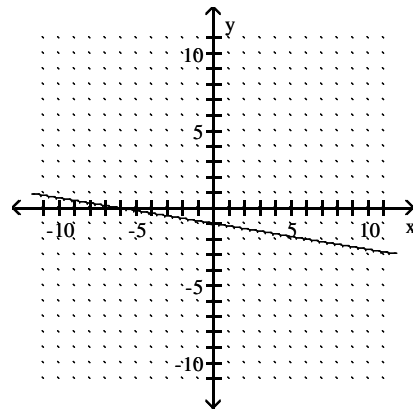
A) $(0, 1); (6, 0)$



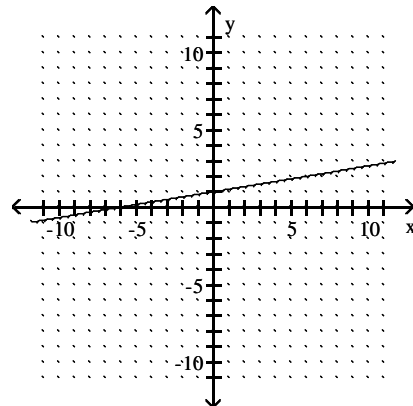
C) $(0, -1); (6, 0)$



B) $(0, -1); (-6, 0)$



D) $(0, 1); (-6, 0)$



18) Rationalize the denominator.

$$\frac{\sqrt{3}}{\sqrt{7} + 5}$$

A) $\frac{\sqrt{21} - 5\sqrt{3}}{2}$

B) $\frac{\sqrt{21} + 5\sqrt{3}}{-18}$

C) $\frac{\sqrt{21} - 5\sqrt{3}}{-18}$

D) $\frac{\sqrt{21} - 5\sqrt{3}}{12}$

E) $\frac{3\sqrt{21} + 7\sqrt{3}}{35}$

19) Divide and simplify.

$$\frac{z^2 + 11z + 24}{z^2 + 16z + 64} \div \frac{z^2 + 3z}{z^2 + 16z + 64}$$

A) $z + 8$

B) $\frac{z + 8}{z}$

C) $\frac{z(z + 6)}{(z + 9)^2}$

D) $\frac{z + 8}{z^2 + 8z}$

E) $\frac{z}{z^2 + 16z + 64}$

20) Solve.

$$x = \sqrt{x + 13} + 7$$

A) 3, 12

B) 3

C) 12

D) -9

21) **Solve the inequality.**

Jim has gotten scores of 75 and 89 on his first two tests. What score must he get on his third test to keep an average of 75 or greater?

- A) At least 61 B) At most 61 C) At least 63 D) At most 63

22) **Factor the expression completely.**

$$x^3 - 2x^2 + 9x - 18$$

- A) $(x^2 - 2x) + 9(x - 2)$ B) $(x + 9)(x^2 - 2x)(x - 2)$
C) $x(x^2 - 2x + 9) - 18$ D) $(x^2 + 9)(x - 2)$

23) **Solve the equation.**

Let $f(x) = |8x - 7|$. Find all x for which $f(x) = 6$.

- A) \emptyset B) $\left\{\frac{1}{8}, \frac{-1}{8}\right\}$ C) $\left\{\frac{-13}{8}, \frac{-1}{8}\right\}$ D) $\left\{\frac{1}{8}, \frac{13}{8}\right\}$ E) $\left\{\frac{11}{3}, \frac{-13}{8}\right\}$

24) **Solve the problem.**

There were 450 people at a play. The admission price was \$2.00 for adults and \$1.00 for children. The admission receipts were \$660. How many adults and children attended?

- A) Adults: 165; children: 285
B) Adults: 210; children: 240
C) Adults: 120; children: 330
D) Adults: 240; children: 210
E) Adults: 285; children: 165

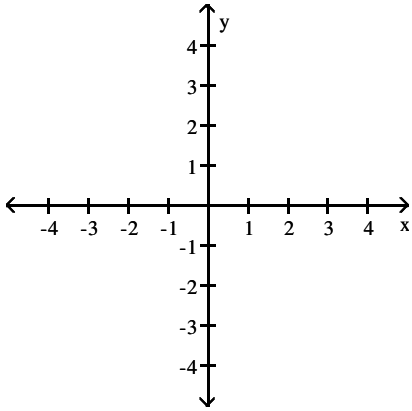
25) **Solve.**

A projectile is thrown upward so that its distance, in feet, above the ground after t seconds is $h = -15t^2 + 450t$. What is its maximum height?

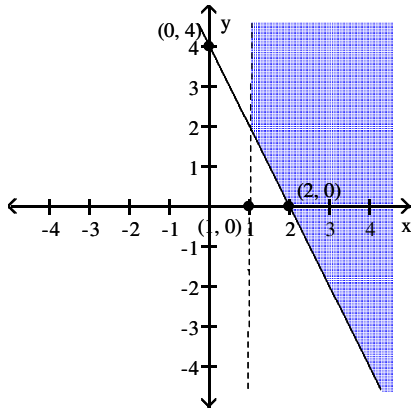
- A) 10,125 ft B) 3375 ft C) 158,625 ft D) 6525 ft

26) Graph the system of linear inequalities.

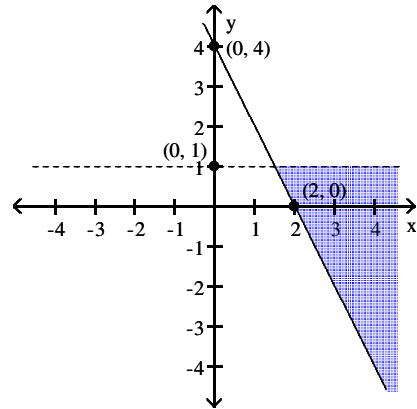
$$2x + y \geq 4 \text{ and } x - 1 > 0$$



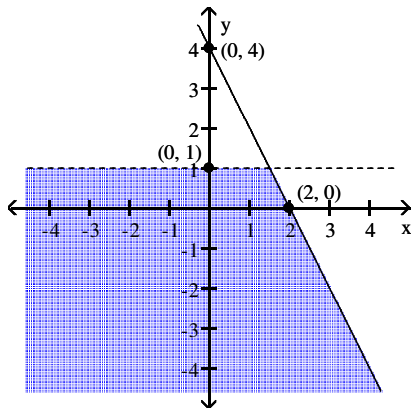
A)



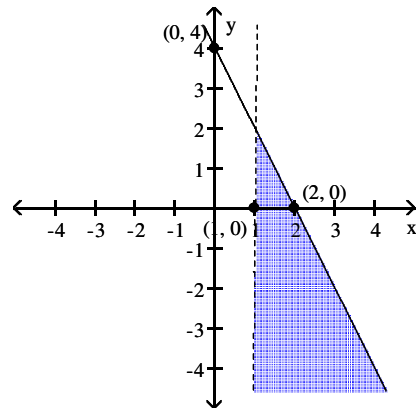
B)



C)



D)



27) Simplify.

$$\frac{\frac{5}{3r-1} - 5}{\frac{5}{3r-1} + 5}$$

A) $\frac{2+3r}{3r}$

B) $\frac{2-r}{r}$

C) $\frac{3r}{2-3r}$

D) $\frac{2-3r}{3r}$

28) Solve.

$$8x - (4x - 1) = 2$$

A) $\frac{3}{4}$

B) $\frac{1}{10}$

C) $-\frac{1}{12}$

D) $\frac{1}{4}$

E) $-\frac{1}{4}$

29) Simplify. Write the answer using positive exponents only.

$$(2x^{-3})^3 (x^2)^{-5}$$

A) $\frac{2}{x^{19}}$

B) $2x^{90}$

C) $\frac{8}{x^{19}}$

D) $\frac{8}{x^{90}}$

30) Find the distance between the pair of points. Give your answer in exact form and where appropriate find an approximation to three decimal places.

$$(-1, -1) \text{ and } (3, 7)$$

A) $4\sqrt{5} \approx 8.944$

B) 48

C) 4

D) $48\sqrt{3} \approx 83.138$

Answer Key

Testname: NEW FINAL A 1010 F2010

- 1) A
- 2) C
- 3) E
- 4) B
- 5) C
- 6) A
- 7) D
- 8) C
- 9) A
- 10) A
- 11) C
- 12) A
- 13) C
- 14) A
- 15) C
- 16) B
- 17) B
- 18) C
- 19) B
- 20) C
- 21) A
- 22) D
- 23) D
- 24) B
- 25) B
- 26) A
- 27) D
- 28) D
- 29) C
- 30) A