

Math 025 Sample Final Exam  
Each Question is worth 5 points.  
Simplify the expression.

1)  $-2(7r + 10) + 8(6r + 4)$

1) \_\_\_\_\_

Simplify.

2)  $240 \div 5 - 2$

2) \_\_\_\_\_

Solve the equation.

3)  $8t - 9 = -7 - 4t$

3) \_\_\_\_\_

Solve the problem.

4) The population of a town is currently 50,000. This represents an increase of 30% from the population 5 years ago. Find the population of the town 5 years ago. Round to the nearest whole number if necessary.

4) \_\_\_\_\_

5) Jill is 22 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 3 km/hr. They meet in 4 hours. How fast is Joe walking?

5) \_\_\_\_\_

Solve the inequality. Write the answer in set-builder notation and graph it.

6)  $-3n - 4 > -4n - 12$

6) \_\_\_\_\_



7)  $-5x \geq 25$

7) \_\_\_\_\_



Solve the equation. First simplify the expression by combining like terms.

8)  $3(y + 2) = 4(y - 4)$

8) \_\_\_\_\_

Solve the equation.

9)  $\frac{1}{4}x - 1 = -\frac{3}{4}x$

9) \_\_\_\_\_

Translate the sentence into an equation using the variable  $x$ .

10) 3 times a number equals 2 less than 4 times the number.

10) \_\_\_\_\_

Find the x and y intercepts for the graph of the equation.

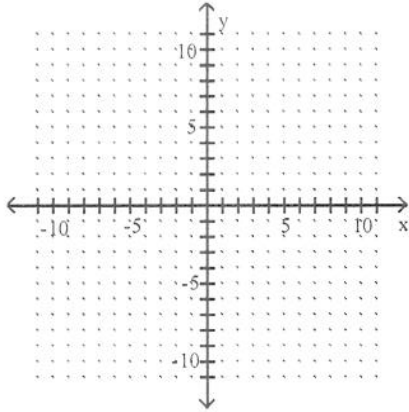
11)  $-2x + 5y = 10$

11) \_\_\_\_\_

Graph the linear equations.

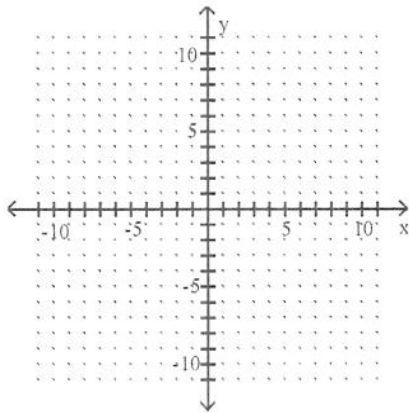
12)  $-9x = y + 3$

12) \_\_\_\_\_



13)  $x = -5$

13) \_\_\_\_\_



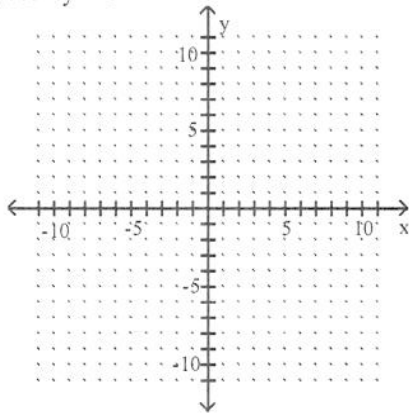
Find the slope of the line going through the given pair of points.

14)  $(-5, 0)$  and  $(0, -9)$

14) \_\_\_\_\_

Graph the linear equation.

15)  $7x + y = 0$



15) \_\_\_\_\_

Simplify the expression.

16)  $(-3x^4y)^5$

16) \_\_\_\_\_

17)  $(2p^3s^3)^4(s^2)$

17) \_\_\_\_\_

Simplify by writing the expression with positive exponents. Assume that all variables represent nonzero real numbers.

18)  $\left(\frac{tz^{-2}}{t^{-3}z}\right)^{-4}$

18) \_\_\_\_\_

Find the numerical value of the rational expression for the given value of x.

19)  $\frac{7x^2 - 5x}{-5x}, x = 3$

19) \_\_\_\_\_

Subtract.

20)  $(9x^5 + 3x^7 - 3 + 9x^6) - (-9 - 7x^6 + 5x^7 - 7x^5)$

20) \_\_\_\_\_

Multiply.

21)  $(5p - 1)(25p^2 + 5p + 1)$

21) \_\_\_\_\_

22)  $(3x + 2y)^2$

22) \_\_\_\_\_

Perform the division.

23)  $(x^2 + 2x - 48) \div (x + 8)$

23) \_\_\_\_\_

Perform the division. Write the answer with positive exponents.

24)  $\frac{28x^6 + 21x^4 + 14x^2}{7x^4}$

24) \_\_\_\_\_

Factor out the greatest common factor.

25)  $81m^8 - 63m^6 + 27m^4$

25) \_\_\_\_\_

Factor by grouping.

26)  $15x^2 + 10x - 9x - 6$

26) \_\_\_\_\_

Factor completely. If the polynomial cannot be factored, write prime.

27)  $x^2 + 7x - 18$

27) \_\_\_\_\_

Factor the binomial completely. If it is prime, say so.

28)  $4x^2 - 49$

28) \_\_\_\_\_

Solve the equations.

29)  $x^2 - x = 6$

29) \_\_\_\_\_

30)  $8r^2 = 2r$

30) \_\_\_\_\_

Find any values of the variable for which the rational expression is undefined. Write answer with  $\neq$ .

31)  $\frac{x^2 - 49}{x^2 + 13x + 36}$

31) \_\_\_\_\_

Write the rational expression in lowest terms.

32)  $\frac{3x + 2}{15x^2 + 16x + 4}$

32) \_\_\_\_\_

Multiply or divide as indicated. Write the answer in lowest terms.

33)  $\frac{k^2 + 6k + 8}{k^2 + 10k + 24} \cdot \frac{k^2 + 6k}{k^2 - 7k - 18}$

33) \_\_\_\_\_

34)  $\frac{x^2 + 14x + 49}{x + 7} \div \frac{x^2 - 49}{7x - 49}$

34) \_\_\_\_\_

Add or subtract. Write the answer in lowest terms.

35)  $\frac{3a + 2b}{2} - \frac{3a - 2b}{2}$

35) \_\_\_\_\_

36)  $\frac{2}{r} + \frac{7}{r - 4}$

36) \_\_\_\_\_

Simplify the radical. Assume that all variables represent nonnegative real numbers.

37)  $\sqrt{8x^2y}$

37) \_\_\_\_\_

Simplify the expression.

38)  $\sqrt{\frac{64}{125}} \cdot \sqrt{\frac{4}{5}}$

38) \_\_\_\_\_

Perform the indicated operations. Assume that all variables represent nonnegative real numbers.

39)  $6\sqrt{48x^2} - 2\sqrt{27x^2} - \sqrt{3x^2}$

39) \_\_\_\_\_

Rationalize the denominator and simplify.

40)  $\frac{2}{\sqrt{3}}$

40) \_\_\_\_\_

Answer Key

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1)  $34r + 12$

2) 46

3)  $\left\{\frac{1}{6}\right\}$

4) 38,462

5) 2.5 km/hr

6)  $(-8, \infty)$



7)  $(-\infty, -5]$

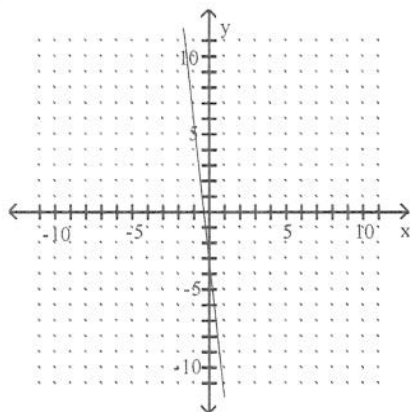
8) {22}

9) {1}

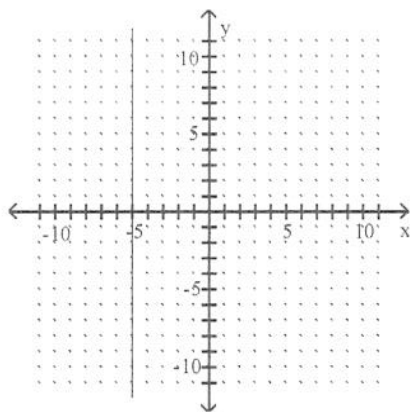
10)  $3x = 4x - 2$

11)  $(-5, 0)$   $(0, 2)$

12)



13)

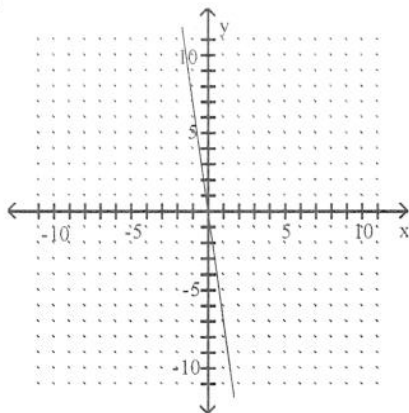


14)  $-\frac{9}{5}$

Answer Key

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15)



16)  $(-3)^5 x^{20} y^5$

17)  $16p^{12} s^{14}$

18)  $\frac{z^{12}}{t^{16}}$

19)  $-\frac{16}{5}$

20)  $-2x^7 + 16x^6 + 16x^5 + 6$

21)  $125p^3 - 1$

22)  $9x^2 + 12xy + 4y^2$

23)  $x - 6$

24)  $4x^2 + 3 + \frac{2}{x^2}$

25)  $9m^4 (9m^4 - 7m^2 + 3)$

26)  $(5x - 3)(3x + 2)$

27)  $(x + 9)(x - 2)$

28)  $(2x + 7)(2x - 7)$

29)  $\{-2, 3\}$

30)  $\left\{0, \frac{1}{4}\right\}$

31)  $x \neq -9, x \neq -4$

32)  $\frac{1}{5x + 2}$

33)  $\frac{k}{k - 9}$

34) 7

35) 2b

36)  $\frac{9r - 8}{r(r - 4)}$

37)  $2x\sqrt{2y}$

38)  $\frac{16}{25}$

39)  $17x\sqrt{3}$

Answer Key

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40)  $\frac{2\sqrt{3}}{3}$