Real Number Line, Intervals

0) Write the definition of "open interval".

1a) Graph the interval for: x is between -8 and -13, not including the endpoints.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.
d) Is this an open or closed interval?

2a) Graph the interval for: x is between 0 and 12, not including the endpoints.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.
d) Is this an open or closed interval?

3a) Graph the interval for: x is between 5 and -6, including the endpoints.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.
d) Is this an open or closed interval?

4a) Graph the interval for: x is between 10 and -14, including the endpoints.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.
d) Is this an open or closed interval?

5a) Graph the interval for: x is greater then 6.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.

6a) Graph the interval for: x is less then 9.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.

7a) Graph the interval for: x is greater than or equal to -8.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.

8a) Graph the interval for: x is less than or equal to -1.
b) Write this interval using inequality notation.
c) Write this interval using interval notation.

9) Write two additional ways to indicate "all real numbers". One uses a special symbol. One uses interval notation.

Percents
No calculator

1) Convert to decimal
a) 93%
b) 8.22%
c) 0.13%
d) 70%
e) 320.2%
f) 0.0299%

2) Convert to percent

a) 0.05
b) 0.611
c) 0.2
d) 0.00033
e) 2.4
f) 0.82

No calculator. Write answers to 3 significant digits.

3a) What is 40% of 298.

3b) What is 0.2% of 39.

3c) What is 108% of 70.22

4a) What percent of 48 is 12.94?

4b) What percent of 8000 is 79?

4c) What percent of 601.3 is 580.9?

5a) The number 80.3 is 30% of what?

5b) The number 100 is 29.7% of what?

5c) The number 9.22 is 143% of what?

Arithmetic of integers

Perform the indicated operation. Write as a fraction as needed. No calculator

a) $12 + 9$

b) $1 + (-8)$

c) $-6 + (-11)$

d) $12 + (-1)$

e) $-3 + 10$

f) $-80 + 12$

g) $12 - 9$

h) $10 - 22$

i) $-2 - 4$

j) $-11 - (-9)$

k) $-3 - (-13)$

l) $82 - (-15)$

m) $3 * 10$

n) $5 * (-9)$

o) $-12 * (-5)$

p) $20 \div 10$

q) $8 \div 17$

r) $-8 \div (2)$

s) $-11 \div 23$

t) $10 \div (-19)$

u) $100 \div (-5)$

v) $-30 \div (-6)$

w) $-1 \div (-9)$

Working with zero

Find each answer. No calculator

a) $9 + 0$

b) $0 + 15$

c) $0 + (-11)$

d) $-39 + 0$

e) $12 - 0$

f) $-81 - 0$

g) $0 - 14$

h) $0 - (-200)$

i) $0 * 20$

j) $16 * 0$

k) $0 * (-112)$

l) $-92 * 0$

m) $0 \div 19$

n) $0 \div (-24)$

o) $3 \div 0$

p) $-88 \div 0$

q) $0 \div 0$

Converting fractions

1) Convert from mixed number to improper fraction

a) $12\frac{1}{5}$

b) $2\frac{9}{13}$

c) $5\frac{3}{7}$

d) $29\frac{3}{4}$

2) Convert from improper fraction to mixed number

a) $\frac{113}{51}$

b) $\frac{80}{7}$

c) $\frac{47}{11}$

d) $\frac{97}{12}$

3) Reduce to lowest terms

a) $\frac{295}{115}$

b) $\frac{84}{8}$

c) $\frac{10}{82}$

d) $\frac{45}{225}$

Fraction arithmetic

Perform the indicated operation. Write each answer in lowest terms. No calculator

a) $\frac{2}{5} + \frac{3}{8}$

b) $\frac{1}{15} + \frac{9}{25}$

c) $\frac{3}{7} + \frac{4}{49}$

d) $\frac{10}{13} - \frac{3}{11}$

e) $\frac{9}{16} - \frac{5}{24}$

f) $\frac{91}{100} - \frac{3}{20}$

g) $\frac{2}{5} * \frac{25}{8}$

h) $\frac{12}{13} * \frac{39}{60}$

i) $\frac{1}{100} * \frac{20}{27}$

j) $\frac{12}{5} \div \frac{3}{11}$

k) $\frac{15}{13} \div \frac{36}{5}$

l) $\frac{1}{20} \div \frac{8}{5}$

Fraction arithmetic with whole numbers.

Perform the indicated operation. Write answers as improper fractions (if applicable).

a) $9 + \frac{3}{7}$

b) $3 + \frac{15}{8}$

c) $8 - \frac{2}{5}$

d) $10 - \frac{19}{3}$

e) $\frac{113}{5} - 10$

f) $12 * \frac{3}{8}$

g) $10 * \frac{13}{5}$

h) $9 \div \frac{3}{10}$

i) $11 \div \frac{31}{5}$

j) $\frac{12}{13} \div 9$

k) $\frac{35}{2} \div 5$

FOILing and Factoring

1) FOIL (or multiply out)

a) $(3x - 4)(2x + 7)$
b) $(x - 4)^2$
c) $(x + 10)(x - 10)$
d) $(x^2 + 3x + 9)(x - 3)$
e) $(2x + 5)^3$

2) Factor. If not possible, write "not possible".
a) $x^2 + 11x + 28$
b) $x^2 + 12x + 20$
c) $x^2 + 6x + 16$
d) $x^2 - 8x - 33$
e) $x^2 - 13x - 40$
f) $x^2 + 4x - 45$
g) $x^2 - 7x + 6$
h) $x^2 - 16x + 64$
i) $x^2 - 5x + 50$
j) $x^2 - 121$
k) $2x^2 + 13x + 15$
l) $4x^2 + 20x + 15$
m) $6x^2 + 23x + 7$
n) $12x^2 + 35x + 18$
o) $5x^2 - 13x - 6$
p) $2x^2 + 7x - 30$
q) $24x^2 + 37x - 5$
r) $10x^2 + 3x - 12$
s) $4x^2 - 23x + 15$
t) $10x^2 - 29x + 10$
u) $8x^2 - 23x + 10$
v) $8x^2 - 26x + 21$
w) $4x^2 - 81$

Solve these linear equations. Check answers.

1) $3x - 9(x - 2) = 11(x + 1)$

2) $\frac{3}{4}(x + 1) + \frac{2}{7}x = \frac{1}{6}(5 - x)$

3) $0.28x + 0.1(x + 1) = 1.2x - 4$

4) $4(x - 3) + 7(2x + 1) = 3(5x + 18) + 3x$

Solve these proportions. Write answers as fractions. Check answers using a calculator.

1) $\frac{3}{x} = \frac{11}{13}$

2) $\frac{2x+3}{9} = \frac{4x-5}{10}$

3) $\frac{10}{x-5} = \frac{25}{7}$

4) $\frac{3}{x-5} = \frac{19}{2x-10}$

Simplify these square roots, if possible. Assume *x* is positive.

a) $\sqrt{60}$

b) $\sqrt{500}$

c) $\sqrt{147}$

d) $\sqrt{44}$

e) $\sqrt{32}$

f) $\sqrt{63}$

g) $\sqrt{144}$

h) $\sqrt{4x^2}$

i) $\sqrt{14x^5}$

j) $\sqrt{75x^{10}}$

k) $\sqrt{18x^9}$

l) $\sqrt{x}\sqrt{x}$

Completing the Square

Complete the square

a) $x^2 + 8x +$ _____

b) $x^2 - 12x +$ _____

c) $x^2 + 13x +$ _____

d) $x^2 - 5x +$ _____

e) $x^2 + x +$ _____

f) $x^2 - 36x +$ _____

Solving Quadratic Equations

Solve each. Choose a method that is appropriate and efficient.

a) $x^2 + 14x = -42$

b) $2x^2 = 100$

c) $2x^2 - 5x = 3$

d) $x^2 + 7x + 5 = 0$

e) $2x^2 + 9x = -8$

f) $x^2 = 120$

g) $x^2 - 3x = 28$

h) $x^2 - 8x - 21 = 0$

i) $x^2 + 10x = 5$

j) $3x^2 - 11 = 0$

k) $x^2 - 3x = 6$

l) $3x^2 + x - 4 = 0$

m) $3x^2 + 4x - 6 = 0$

n) $6x^2 - 11x - 10 = 0$

o) $x^2 - 2x - 9 = 0$

p) $x^2 - 81 = 0$