

Problem 1 _____ [/6]

Find the prime factorizations of the following numbers.

(a) 60

(b) 72

(c) 26

Problem 2 _____ [/12]

Evaluate the following expressions involving fractions and write the results in the simplest form.

(a) $\frac{45}{81} =$

(d) $\frac{20}{27} \cdot \frac{9}{25} =$

(b) $\frac{2}{3} - \frac{3}{4} =$

(e) $\frac{16}{9} \div \frac{8}{27} =$

(c) $\frac{11}{3} + \frac{3}{2} - \frac{5}{9} =$

(f) $5 \cdot \frac{42}{35} =$

Problem 3 _____ [/9]

Evaluate the following powers.

(a) $1^0 =$

(d) $2^3 =$

(g) $\left(\frac{3}{5}\right)^2 =$

(b) $0^1 =$

(e) $(-5)^3 =$

(h) $-2^2 =$

(c) $3^2 =$

(f) $(-1)^{631} =$

(i) $100123^1 =$

Problem 4 _____ [/12]

Evaluate the following expressions by respecting the order of operations.

(a) $\left(\frac{5}{7} + \frac{3}{2}\right) \div \frac{|5 - 2^2|}{5 - (-9)} =$

(b) $\left| (8 - 9)^{12} - 3 \right| + 5^2 \div \frac{16}{5 - (-3)^1} =$

$$(c) \frac{3 - 2(5 - 4^2)}{1 + 2(1 + 2)} \div \frac{14}{5} - \frac{|1 - 2^2|}{3} =$$

Problem 5 _____ [/12]

Expand and simplify the following polynomial expressions.

$$(a) (5x - 1)(7 - 3x) + 1 - 3x =$$

$$(b) x^2 - x(1 - 3(x + 2)) - (2x - 3)(x + 2) =$$

$$(c) (4x + 3)^3 =$$

Problem 6 _____ [/9]

Convert each algebraic expression to a product form by using the appropriate algebraic identity.

$$\boxed{1. (a - b)(a + b) = a^2 - b^2}$$

$$\boxed{2. (a - b)(a^2 + ab + b^2) = a^3 - b^3}$$

$$\boxed{3. (a + b)(a^2 - ab + b^2) = a^3 + b^3}$$

$$(a) 27x^3 - 1 =$$

$$(b) 49x^2 - 4 =$$

$$(c) 125 + x^3 =$$

Problem 7 _____ [/12]

Solve the following linear equations.

(a)

$$3(1 - 2(x - 3)) + 1 = 3 - 9(x - 2) + 8$$

(c)

$$4x + 2(x - 1) = 6(x - 2) + 10$$

(b)

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

(d)

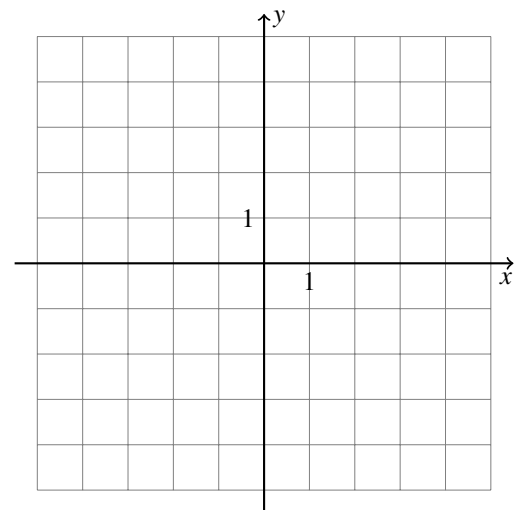
$$\frac{x}{2} + \frac{7}{3} = \frac{x}{4} - \frac{5}{9}$$

Problem 8 _____ [/8]Consider the linear equation $4x + 5y = 20$.(a) Bring the equation to the standard form $y = ax + b$.

(b) What is the slope of the line?

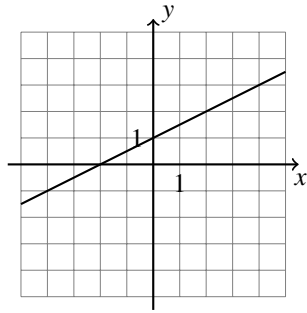
(c) What is the y-intercept of the line?

(d) Sketch the line.



Problem 9 _____ [/2]

Find the standard form $y = ax + b$ of the equation of the line graphed below.

**Problem 10** _____ [/18]

Find the equation of the lines described below.

- (a) The line passing through the point $(3, 0)$ whose slope is 2.
- (b) The horizontal line passing through the point $(5, 1)$.
- (c) The line passing through the points $(-1, 3)$ and $(-2, 0)$.
- (d) The line passing through the point $(1, 1)$ and parallel to the line $y = 3x + 1$.
- (e) The vertical line passing through the point $(3, -7)$.
- (f) The line passing through the point $(4, 3)$ and perpendicular to the line $y = -2x + 3$.