Part A (Algebra / MTH100)
Sample Questions

Find the square.

1) $(w - 14)^2$

A) $196w^2 - 28w + 196$
B) $w^2 - 28w + 196$
C) $w + 196$
D) $w^2 + 196$

Simplify the expression. Use positive exponents. Assume variables represent nonzero real numbers.

2) $(-5p)^2 (-5p)^8$

A) $-5^{10}p^{10}$
B) $5^{10}p$
C) $25p^{10}$
D) $5^{10}p^{10}$

Factor as completely as possible. If unfactorable, indicate that the polynomial is prime.

3) $10z^2 + 11z - 6$

A) $(2z + 3)(5z - 2)$
B) $(10z + 3)(z - 2)$
C) $(2z - 3)(5z + 2)$
D) prime

Factor completely.

4) $27a^4 - 48b^2$

A) $3(3a^2 - 4b)^2$
B) $3(3a^2 + 4b)^2$
C) $3(3a^2 + 4b)(3a^2 - 4b)$
D) Prime

Factor the polynomial.

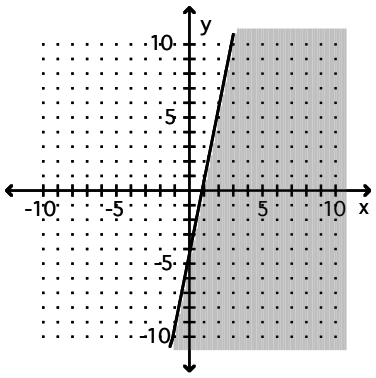
5) $xa + 3a - xt - 3t$

A) $(x - 3)(a + t)$
B) $(x - t)(a + 3)$
C) $(x + a)(3 - t)$
D) $(x + 3)(a - t)$

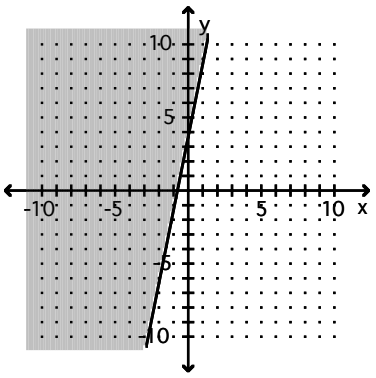
Graph the linear inequality in two variables.

6) $5x - y \leq 4$

A)



B)



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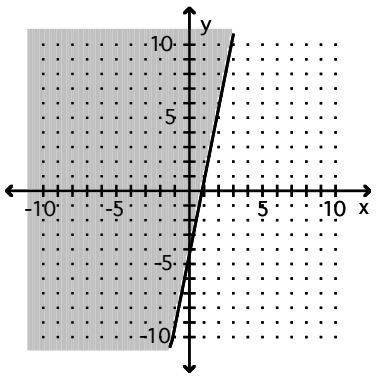

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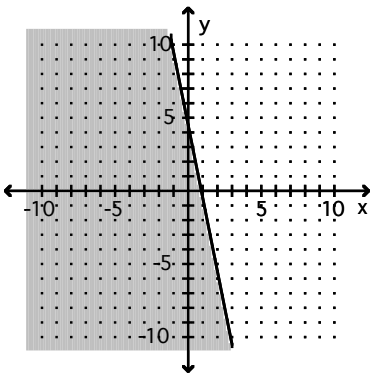


Find the solution set for the equation.

7) $|8x + 7| + 8 = 13$

A) $\left\{-\frac{2}{7}, -\frac{12}{7}\right\}$ B) $\varnothing$ C) $\left\{-\frac{1}{4}, -\frac{3}{2}\right\}$ D) $\left\{\frac{1}{4}, \frac{3}{2}\right\}$

Solve the equation by first clearing the fractions.

8) $\frac{4}{5}y - (y + \frac{2}{3}) = \frac{1}{30}(y + 6)$

A) $\{2\}$ B) $\left\{-\frac{26}{5}\right\}$ C) $\left\{\frac{26}{53}\right\}$ D) $\left\{-\frac{26}{7}\right\}$

Solve the problem.

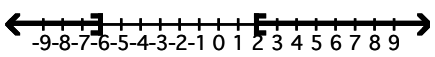
9) One half of a number is 3 more than one–sixth the same number. What is the number?

A) 12 B) 9 C) 8 D) 18

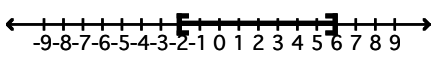
Solve and graph the solution set on a number line.

10) $3 + \left|1 - \frac{x}{2}\right| \geq 5$

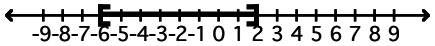
A) $(-\infty, -6] \cup [2, \infty)$



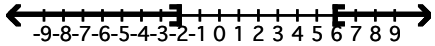
B) $[-2, 6]$



C) $[-6, 2]$



D) $(-\infty, -2] \cup [6, \infty)$



Write the inequality in interval notation.

11) $x \leq -2$

A) $(-\infty, -2]$ B) $(-\infty, -2)$ C) $[-2, \infty)$ D) $(-2, \infty)$

Determine whether the two lines are parallel, perpendicular, or neither parallel nor perpendicular.

12) $3x - 6y = -12$

$18x + 9y = -9$

A) Parallel B) Perpendicular C) Neither

Find the slope of the line.

13) $3x - 4y = 17$

A) $-\frac{3}{4}$ B) $\frac{4}{3}$ C) $\frac{3}{4}$ D) $-\frac{4}{3}$

Find the axis, domain, and range of the parabola.

14) $f(x) = x^2 + 6x + 6$

A) axis: $x = -6$
domain: $[-3, \infty)$
range: $(-\infty, \infty)$

B) axis: $x = -3$
domain: $(-\infty, \infty)$
range: $[-3, \infty)$

C) axis: $x = -6$
domain: $(-\infty, -3]$
range: $(-\infty, \infty)$

D) axis: $x = -3$
domain: $(-\infty, \infty)$
range: $(-\infty, -3]$

Find the product.

15) $(x - 8)(-4x - 10)$

A) $-4x^2 + 20x + 80$

B) $-4x^2 + 22x + 80$

C) $-4x^2 + 22x + 22$

D) $-4x^2 + 80x + 22$

Perform the division.

16) $\dfrac{40x^8y^8 + 20x^5y^6 + 36x^2y^4}{4x^2y^4}$

A) $10x^6y^8 + 5x^3y^6 + 9y^4$

B) $10x^6y^4 + 5x^3y^2 + 9$

C) $10x^8y^8 + 5x^5y^6 + 9x^2y^4$

D) $-10x^6y^4 + 5x^3y^2 - 9$

17) $\dfrac{x^2 - 5x - 24}{x - 8}$

A) $x + 3$

B) $x^2 + 3$

C) $x - 3$

D) $x + 3 + \dfrac{8}{x - 8}$

Perform the indicated operation.

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

A) $-3x^3 + x^2 - 15x - 7$

B) $-3x^3 - 4x^2 - 10x - 6$

C) $-2x^3 - 15x - 6$

D) $-3x^3 + x^2 - 15x - 6$

Solve the equation.

19) $12c^3 + 26c^2 + 10c = 0$

A) {0}

B) $\left\{-\frac{5}{4}, -\frac{2}{3}\right\}$

C) $\left\{\frac{5}{3}, -\frac{5}{3}\right\}$

D) $\left\{-\frac{5}{3}, -\frac{1}{2}, 0\right\}$

Perform the indicated operation and express in lowest terms.

20) $\frac{(2x - 7)(x + 1)}{(x + 8)(x - 4)} \div \frac{(x + 1)(3x + 7)}{(x + 8)(x - 4)}$

A) $\frac{x - 8}{x + 2}$

B) $\frac{2x - 7}{3x + 7}$

C) $-\frac{2x - 7}{3x + 7}$

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