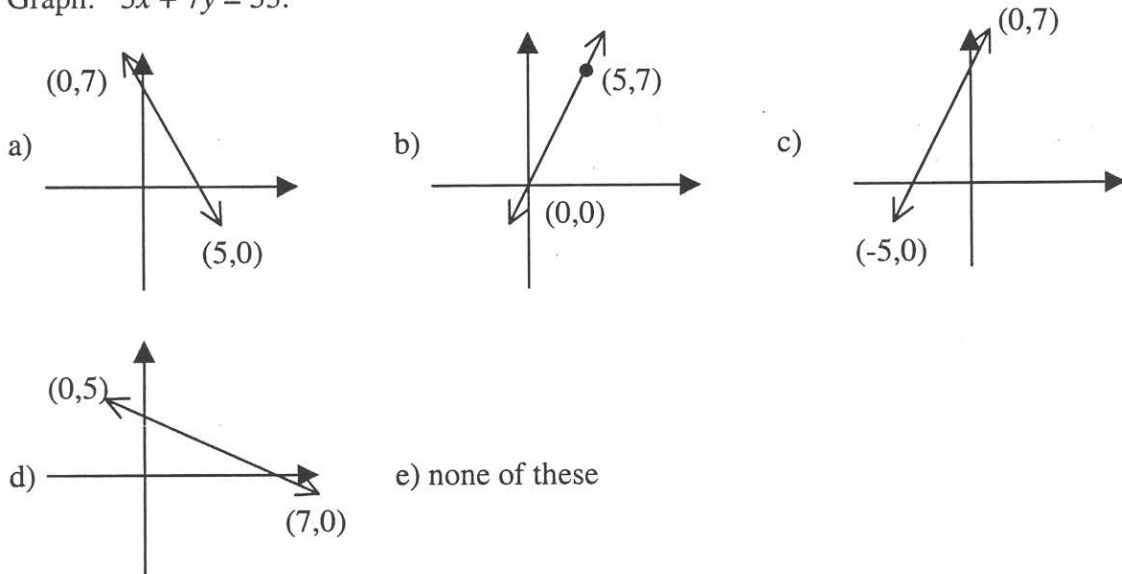


Mathematics Competency Sample Exam – Ver 03

1. Tanya has 21 coins consisting of nickels and dimes amounting to \$1.75. How many dimes does she have?
 a) 14 b) 12 c) 10 d) 8 e) 7

2. Divide: $(2x^2 + 3x - 14) \div (x - 2)$
 a) $2x + 7$ b) $2x^2 - 10$ c) $-x - 7$ d) $2x - 7 - \frac{28}{x - 2}$ e) none of these

3. Graph: $5x + 7y = 35$.



4. Perform the indicated operation and simplify: $\frac{x^2 - 3x}{x + 3} \cdot \frac{x^2 + 5x + 6}{x^2 - x - 6}$
 a) x b) $\frac{x + 2}{-2}$ c) $\frac{x(x - 3)}{x + 3}$ d) $\frac{x(x - 3)^2}{(x + 3)^2}$ e) $\frac{x(x + 3)(x + 1)}{(x + 3)(x - 1)}$

5. Simplify $\frac{\sqrt{2x}}{\sqrt{12y}}$
 a) $\frac{\sqrt{6xy}}{6y}$ b) $\frac{\sqrt{24xy}}{12y}$ c) $\frac{x\sqrt{6y}}{y}$ d) $\frac{\sqrt{xy}}{y}$ e) $\frac{3\sqrt{xy}}{y}$

6. Solve: $\frac{x}{x - 1} + \frac{2}{x + 1} = \frac{8}{3}$
 a) $x = \frac{-1}{2}, 3$ b) $x = -2, \frac{1}{5}$ c) $x = -5, -3$ d) $x = \frac{-1}{5}, 2$ e) $x = 0, 5$

7. Find the equation of the line going through the points (-6, 7) and (2,2).

a) $8x - 5y = -26$

b) $5x - 4y = 13$

c) $5x + 8y = 26$

d) $4x - 5y = -11$

e) $8x + 5y = -13$

8. Solve: $3x^2 - 2x - 4 = 0$

a) $x = \frac{-2 - \sqrt{52}}{6}, \frac{-2 + \sqrt{52}}{6}$

b) $x = \frac{1 - \sqrt{13}}{3}, \frac{1 + \sqrt{13}}{3}$

c) $x = \frac{1 - \sqrt{11}}{3}, \frac{1 + \sqrt{11}}{3}$

d) $x = \frac{-4}{3}, \frac{2}{3}$

e) \emptyset

9. Combine: $\frac{3}{x^2 + 3x - 4} - \frac{4}{x^2 - 6x - 40}$

a) $\frac{-x - 26}{(x-1)(x+4)(x-10)}$

b) $\frac{-x - 11}{(x-1)(x+4)(x-10)}$

c) $\frac{2x}{(x-1)(x+4)}$

d) $\frac{7x - 26}{(x-1)(x+4)(x-10)}$

e) $\frac{-x + 34}{(x-1)(x+4)(x-10)}$

10. Multiply: $(12x - 5)^2$

a) $24x^2 - 10$

b) $144x^2 - 25$

c) $144x^2 + 25$

d) $144x^2 - 60x + 25$

e) $144x^2 - 120x + 25$

11. Solve: $\sqrt{2y - 3} = 3$

a) $y = 18$

b) $y = 6$

c) $y = 3$

d) $y = 0$

e) none of these

12. Solve for x and y: $\begin{cases} 5x + 3y = 7 \\ 2x + 4y = 0 \end{cases}$

a) $x = -1, y = 2$

b) $x = 0, y = 1$

c) $x = 1, y = 0$

d) $x = 2, y = -1$

e) $x = 3, y = -2$

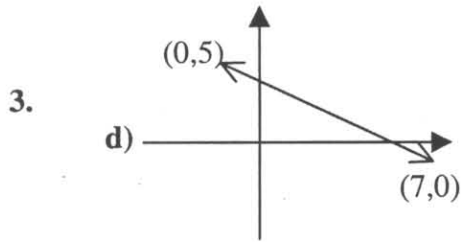
13. Simplify: $\frac{\frac{1}{x} + \frac{2}{y}}{\frac{1}{x^2} - \frac{2}{y}}$
- a) $\frac{y-2x^2}{xy+2x^2}$ b) $\frac{1}{x}$ c) $\frac{xy+2x^2}{y-2x^2}$ d) x e) $\frac{y+2x}{y-2x^2}$
14. Solve: $\frac{3}{4}x + \frac{1}{5} = \frac{3}{10}$
- a) $x = 2$ b) $x = -\frac{2}{3}$ c) $x = -\frac{1}{15}$ d) $x = \frac{2}{15}$ e) $x = \frac{5}{3}$
15. Simplify: $(-3x^2y^3)^2 (-x^2y)^3$
- a) $6x^{10}y^9$ b) $-9x^{10}y^9$ c) $3x^{10}y^9$ d) $-6x^{12}y^{12}$ e) $9x^{12}y^{12}$
16. Solve: $-5 < 2y - 7$
- a) $y < 1$ b) $y > 1$ c) $y > -1$ d) $y < -6$ e) $y > -6$
17. Simplify: $\left(\frac{3}{4}\right)^{-2}$
- a) $\frac{6}{8}$ b) -9 c) $\frac{-9}{16}$ d) $\frac{16}{9}$ e) $\frac{16}{-9}$
18. Multiply: $(3\sqrt{7} - \sqrt{3})(\sqrt{7} + 2\sqrt{3})$
- a) $27 + 7\sqrt{21}$ b) $27 + 5\sqrt{21}$ c) $15 + 5\sqrt{21}$ d) $-15 - \sqrt{21}$
- e) $27 - 5\sqrt{21}$
19. Four cheeseburgers and five milkshakes cost a total of \$8.35. Two milkshakes cost \$0.35 more than one cheeseburger. Find the cost of a cheeseburger.
- a) \$0.75 b) \$1.74 c) \$3.13 d) \$1.15 e) none of these
20. Find the product and simplify: $(2x-1)(6x^2+5x+3)$
- a) $12x^3 - 3$ b) $12x^3 + 4x^2 + 11x + 3$ c) $12x^3 + 4x^2 + x - 3$ d) $12x^3 + 15x + 3$
- e) none of these

Mathematics Competency Sample Exam

Answer sheet

1. a) 14

2. a) $2x + 7$



4. a) x

5. a) $\frac{\sqrt{6xy}}{6y}$

6. d) $x = \frac{-1}{5}, 2$

7. c) $5x + 8y = 26$

8. b) $x = \frac{1 - \sqrt{13}}{3}, \frac{1 + \sqrt{13}}{3}$

9. a) $\frac{-x - 26}{(x - 1)(x + 4)(x - 10)}$

10. e) $144x^2 - 120x + 25$

11. b) $y = 6$

12. d) $x = 2, y = -1$

13. c) $\frac{xy + 2x^2}{y - 2x^2}$

14. d) $x = \frac{2}{15}$

15. b) $-9x^{10}y^9$

16. b) $y > 1$

17. d) $\frac{16}{9}$

18. c) $15 + 5\sqrt{21}$

19. d) \$1.15 for a cheeseburger

20. c) $12x^3 + 4x^2 + x - 3$