

Objectives for Competency Test Correlated with Test Questions.

- 1 Order of Operations (No grouping/ No exponents)
- 2 Order of Operations
- 3 Absolute value with addition and subtraction.
- 4 Simplify algebraic expression (Distributive property).
- 5 Evaluate algebraic expression
- 6 Solving linear equations
- 7 Solving linear equations (may have fractions)
- 8 Solving literal equations
- 9 Translate word problems (numbers)
- 10 Solve word problems
- 11 Translate word problems (proportions)
- 12 Simplifies exponential expression (Positive integer exponents)
- 13 Simplifies exponential expression (Positive & negative integer exponents)
- 14 Simplifies exponential expression (Positive & negative & zero integer exponents)
- 15 Scientific notation (to and from)
- 16 (Polynomial) – (Polynomial)
- 17 (Monomial)(Binomial)
- 18 (Binomial)(Binomial)
- 19 Factoring a polynomial – Greatest Common Factor(s)
- 20 Factoring a polynomial – Difference of Squares
- 21 Factoring by grouping
- 22 Factoring a trinomial
- 23 Simplifies a rational expression – Reduce by factoring
- 24 Solving a quadratic equation by factoring ($a = 1$)
- 25 Solving a quadratic equation by factoring ($a \neq 1$)
- 26 Simplify square root of a monomial
- 27 Simplify square roots in a polynomial using distributive property
- 28 Solving a linear inequality
- 29 Identify intercepts of a linear equation ($ax + by = c$)
- 30 Match linear equation to graph ($ax + by = c$) or ($y = mx + b$)

State Test Review: Q1,2,3,4

- Simplify: $3 - 9 + 8 \cdot 5$
 -82 10 -46 34
- Simplify: $16 - 20 \div 10 + 3$
 $\frac{188}{13}$ 17 21 $-\frac{4}{13}$
- Simplify: $6 + 3 \cdot 6 \div 3 \cdot 4 - 3$
 69 $\frac{9}{2}$ 18 27
- Simplify: $25 - (4)^2 \div (11 - 7) \cdot 5$
 105 5 $\frac{121}{5}$ $\frac{45}{4}$
- Simplify: $(12 - 9)^2 \div 3$
 21 1 3 2
- Simplify: $(3 - 7)^2 - (3 + 3)^3$
 -26 -2 232 -200
- Simplify: $2 + 2(9 - 3)^2$
 144 48 74 26
- Simplify: $|-16| + |-5| - |16|$
 27 5 37 -5
- Simplify: $-|-3| + |-9|$
 12 -12 -6 6
- Simplify: $|5 + (-16)| + 5$
 -16 16 -6 26
- Simplify: $-8z - 6(z + 5) + 5$
 $-38z + 5$ $-14z - 1$ $-14z - 25$ $-14z - 30$
- Simplify: $-5[-6(t - 3) + t]$
 $-25t + 90$ $25t - 90$ $-35t + 90$ $25t + 90$

State Test Review: Q5,6,7,8

- Evaluate the given expression when $w = -4$: $4w^2 + 5w + 3$
 41 81 87 47
- Evaluate the given expression when $x = -6, y = 2, z = -7$: $-4xy - z$
 55 -41 41 -55
- Solve for q : $4(-4q + 9) = -2q + 3$
 $q = \frac{33}{14}$ $q = -\frac{39}{14}$ $q = \frac{11}{6}$ $q = -\frac{13}{6}$
- Solve for x : $-8(-3x - 8) = 8x - 7$
 $x = -\frac{71}{32}$ $x = \frac{57}{32}$ $x = -\frac{71}{16}$ $x = \frac{57}{16}$
- Solve for y : $-8(3y + 6) = 2(y + 3)$
 $y = \frac{21}{11}$ $y = -\frac{27}{13}$ $y = \frac{27}{13}$ $y = \frac{21}{13}$
- Solve for r : $\frac{8}{3}r - 3 = 5$
 $r = \frac{9}{4}$ $r = \frac{3}{4}$ $r = 3$ $r = \frac{3}{2}$
- Solve for t : $-\frac{7}{4}t - 8 = -4$
 $t = \frac{24}{7}$ $t = \frac{8}{7}$ $t = \frac{48}{7}$ $t = -\frac{16}{7}$
- Solve for q : $\frac{5}{4}q + 2 = \frac{7}{4}$
 $q = -\frac{5}{16}$ $q = 1$ $q = -\frac{1}{5}$ $q = 3$
- Solve for u : $x = -2z - 4u$
 $u = -\frac{1}{4}x + \frac{1}{2}z$ $u = -\frac{1}{4}x + 2z$ $u = -\frac{1}{4}x - 2z$ $u = -\frac{1}{4}x - \frac{1}{2}z$
- Solve for y : $u = 6zy$
 $y = \frac{1}{6}\frac{u}{z}$ $y = \frac{1}{6}u - \frac{1}{6}z$ $y = -\frac{1}{6}\frac{u}{z}$ $y = \frac{u-6}{z}$
- Solve for W : $P = 2L + 2W$
 $W = 2P - L$ $W = \frac{1}{2}P + L$ $W = P - L$ $W = \frac{1}{2}P - L$
- Solve for H : $A = \frac{BH}{2}$
 $H = 2AB$ $H = \frac{1}{2}AB$ $H = \frac{1}{2}\frac{A}{B}$ $H = 2\frac{A}{B}$
- Solve for r : $A = \pi r^2$
 $r = \pi\sqrt{A}$ $r = \sqrt{\pi A}$ $r = \pi A^2$ $r = \sqrt{A + \pi}$

State Test Review: Q9,10,11

- If 6 times a number is increased by 19, the result is 10 less than the square of the number. Choose the equation that could be used to find this number, x .
 $6x + 19 = x^2 - 10$ $6(x + 19) = x^2 - 10$ $6x + 19 = 10 - x^2$ $25x = x^2 - 10$
- The sum of a number and 2 is 20 more than twice the number. Find the equation that could be used to find this number, x .
 $x + 2 = 2x + 20$ $x + 2 = 2(x + 20)$ $x + 2 = x^2 + 20$ $2x = 2x + 20$
- If a television costs \$304 after a 20% discount, what was the original cost?
 \$ 364.8 \$ 380.0 \$ 284.0 \$ 1520.0
- The length of a rectangle is 14 feet more than the width. The perimeter of the rectangle is 88 feet. Find the length.
 37 feet 51 feet 29 feet 15 feet
- Two cars leave the same point at the same time traveling in opposite directions. One car travels west at 30 miles per hour and the other travels east at 70 miles per hour. In how many hours will they be 260 miles apart?
 $\frac{26}{5}$ hours $\frac{13}{2}$ hours 260 hours $\frac{13}{5}$ hours
- Find the amount of money now necessary to be invested at 8% simple interest to yield \$ 220 interest in 4 years.
 \$ 110.0 \$ 687.5 \$ 440.0 \$ 5500.0
- The perimeter of a triangle is 24 inches. The length of the middle side is 3 inches more than the length of the smallest side and the largest side is 5 inches more than twice the length of the smallest side. Find the length of the smallest side.
 5 inches 6 inches 3 inches 4 inches
- Identify the proportion listed below that solves this problem:
A car can travel 387 miles on 14 gallons of gasoline. How far can the car travel on 19 gallons?
 $\frac{14}{387} = \frac{x}{19}$ $\frac{387}{19} = \frac{14}{x}$ $\frac{387}{14} = \frac{x}{19}$ $\frac{387}{x} = \frac{19}{14}$
- Identify the proportion listed below that solves this problem:
If 41 pounds of jelly beans cost 92 cents, how many pounds jelly beans can be purchased for 151 cents?
 $\frac{41}{92} = \frac{x}{151}$ $\frac{41}{151} = \frac{92}{x}$ $\frac{92}{41} = \frac{x}{151}$ $\frac{41}{x} = \frac{151}{92}$

State Test Review: Q12,13,14

This is a review for Expressions using positive, negative, and zero exponents.

1. Simplify $(a^4b^3)^3(a^3b^3)$
 $a^{15}b^{12}$ $a^{15}b^9$ $a^{12}b^9$ $a^{12}b^{12}$

2. Simplify: $\frac{(2x^6y^3)^3}{x^3}$
 $2x^{15}y^9$ $2x^{21}y^9$ $8x^{21}y^9$ $8x^{15}y^9$

3. Simplify: $(2t^4x^0)^5$
 $10t^9x^5$ $32t^{20}$ $32t^9x^5$ $10t^{20}$

4. Simplify: $\frac{x^5y^0z^7}{x^4y^6z^2}$
 $\frac{1}{xy^6z^5}$ $\frac{xz^5}{y^6}$ xy^6z^5 $\frac{x}{y^6z^5}$

5. Simplify: $\frac{x^3y^4z^6}{x^9y^0z^3}$
 $\frac{z^3y^4}{x^6}$ $\frac{1}{x^6y^4z^3}$ $\frac{x^6y^4}{z^3}$ $x^6y^4z^3$

6. Simplify: $\frac{a^{-1}b^3}{a^1b^{-1}}$
 $\frac{1}{a^2b^4}$ a^2b^4 $\frac{a^2}{b^4}$ $\frac{1}{a^2}b^4$

7. Simplify: $\frac{a^{-4}b^5}{a^3b^{-3}}$
 $\frac{1}{a^7}b^8$ $\frac{a^7}{b^8}$ $\frac{1}{a^7b^8}$ a^7b^8

8. Simplify: $(v^8z^0)^{-2}$
 $\frac{v^6}{z^2}$ v^{16} $v^{10}z^2$ $\frac{1}{v^{16}}$

9. Simplify: $(z^4w^{-3})^{-9}$
 $\frac{w^{27}}{z^{36}}$ $z^{13}w^6$ $\frac{1}{z^5w^{12}}$ $\frac{z^{36}}{w^{27}}$

State Test Review: Q15,16,17,18

This is a review for Scientific Notation and Operations with Polynomials.

- Convert to standard form: 1.85×10^6
 00.000000185 1850000.0 18500000.0 00.0000185
- Convert to standard form: 9.54×10^{-7}
 954000000.0 00.0000000954 00.000000954 9540000.0
- Convert to scientific notation: 031200000.0
 0.312×10^8 3.12×10^8 3.12×10^7 3.12×10^{-7}
- Convert to scientific notation: 0.000000285
 2.85×10^7 2.85×10^{-7} 0.285×10^{-6} 2.85×10^{-6}
- Simplify: $(7x^2 - 2x - 8) + (6x^2 - 6x + 5)$
 $13x^2 - 8x - 3$ $13x^2 - 8x + 13$ $13x^2 - 4x - 3$ $x^2 + 4x - 13$
- Simplify: $(7x^2 + 2x - 7) - (4x^2 - 8x + 7)$
 $3x^2 + 10x$ $3x^2 - 6x - 14$ $3x^2 + 10x - 14$ $3x^2 - 6x$
- Simplify: $(5x^2 - 2x + 4) - (4x^2 - 5x - 5)$
 $x^2 + 3x + 9$ $x^2 - 3x - 1$ $x^2 - 7x - 1$ $x^2 + 3x - 1$
- Simplify: $7x(5x - 4)$
 $35x^2 - 28x$ $7x^2$ $12x^2 - 28x$ $35x^2 + 28x$
- Simplify: $-6x(-7x + 5)$
 $42x^2 - 30x$ $-42x^2 - 30x$ $12x^2$ $42x^2 + 30x$
- Simplify: $(4x - 9)(2x - 3)$
 $8x^2 - 6x - 27$ $8x^2 + 6x + 27$ $8x^2 - 30x + 27$ $8x^2 - 30x - 27$
- Simplify: $(5x + 6)(-3x - 2)$
 $15x^2 - 28x - 12$ $-15x^2 - 8x - 12$ $-15x^2 - 28x - 12$ $-15x^2 + 28x - 12$
- Simplify: $(5x + 2)(9x^2 + 4x - 5)$
 $45x^3 + 38x^2 - 17x - 10$ $45x^3 - 38x^2 + 33x - 10$ $45x^3 + 2x^2 + 33x - 10$
 $45x^3 + 38x^2 + 33x + 10$
- Simplify: $(5x^2 + 8x + 5) \div 2x$
 $\frac{5}{2}x^2 + 13$ $\frac{5}{2}x + 4 + \frac{5}{2x}$ $5x + 8 + \frac{5}{2x}$ $10x^2 + 16x + 10$

Form A

State Test Review: Q19,20,21,22

This is a review for Factoring of GCF, difference of squares, grouping, and trinomial.

- Factor completely: $34w^{20}u^{18} + 14w^{32}u^{16} + 22w^{12}u^6$
 $\hookrightarrow 2w^{12}u^6(17w^8u^{12} + 7w^{20}u^{10} + 11)$ $\hookrightarrow 2w^4u^2(17w^5u^9 + 7w^8u^8 + 11w^3u^3)$
 $\hookrightarrow 2w^{11}u^5(17w^9u^{13} + 7w^{21}u^{11} + 11wu)$ $\hookrightarrow 2wu(17w^{19}u^{17} + 7w^{31}u^{15} + 11w^{11}u^5)$
- Factor completely: $45w^9t^{16} - 27w^6t^4$
 $\hookrightarrow 9w^6t^4(5w^3t^{12} - 3)$ $\hookrightarrow 9w^6t^4(5w^3t^{12} - 9t)$ $\hookrightarrow 9w^9t^4(5wt^{12} - 3t)$
 $\hookrightarrow 9w^3t^4(5w^3t^4 - 3w^2t)$
- Factor completely: $x^2 - 4$
 $\hookrightarrow (x^2 - 2)(x^2 + 2)$ $\hookrightarrow (x+6)(3x-2)$ $\hookrightarrow (x-2)^2$ $\hookrightarrow (x-2)(x+2)$
- Factor completely: $y^2 - 16t^2$
 $\hookrightarrow (y+8t)(y-2t)$ $\hookrightarrow (y+2t)(y-8t)$ $\hookrightarrow (y-4t)(y+4t)$ $\hookrightarrow (y-4t)^2$
- Factor completely: $5s^2 + 4sy + 5s + 4y$
 $\hookrightarrow (s+1)(5s+4y)$ $\hookrightarrow (s-1)(5s+4y)$ $\hookrightarrow (s+y)(5s+4)$ $\hookrightarrow (s+1)(5s-4y)$
- Factor completely: $xt + xk + at + ak$
 $\hookrightarrow (x-a)(t+k)$ $\hookrightarrow (x-a)(t-k)$ $\hookrightarrow (x+a)(t-k)$ $\hookrightarrow (x+a)(t+k)$
- Identify a factor of the following trinomial: $2t^2 - t - 1$
 $\hookrightarrow (4t+1)$ $\hookrightarrow (t+2)$ $\hookrightarrow (4t-1)$ $\hookrightarrow (t-1)$
- Identify a factor of the following trinomial: $8w^2 - 41w + 5$
 $\hookrightarrow (8w+5)$ $\hookrightarrow (w-1)$ $\hookrightarrow (w-5)$ $\hookrightarrow (8w-5)$
- Identify a factor of the following trinomial: $7q^2 - 47q + 30$
 $\hookrightarrow (q-6)$ $\hookrightarrow (q-5)$ $\hookrightarrow (7q-6)$ $\hookrightarrow (7q+6)$
- Identify a factor of the following trinomial: $8z^2 - 35z + 12$
 $\hookrightarrow (z-3)$ $\hookrightarrow (2z+1)$ $\hookrightarrow (2z-1)$ $\hookrightarrow (z-4)$

State Test Review: Q23,24,25

This is a review for Simplifying a rational expression by factoring and Solving an equation by factoring.

1. Simplify: $\frac{x^2 - x - 42}{x^2 - 3x - 28}$

$\textcircled{C} \frac{x+6}{x-4}$ $\textcircled{C} \frac{x+6}{x+4}$ $\textcircled{C} \frac{x-6}{x-4}$ $\textcircled{C} \frac{x-6}{x+4}$

2. Simplify: $\frac{3x^2 - 7x + 4}{2x^2 - 5x + 3}$

$\textcircled{C} \frac{3x-4}{2x-3}$ $\textcircled{C} \frac{3x+4}{2x-3}$ $\textcircled{C} \frac{3x-4}{2x-1}$ $\textcircled{C} \frac{x-4}{2x-3}$

3. Simplify: $\frac{x^2 + 5x + 6}{2x^2 + 3x - 2}$

$\textcircled{C} \frac{x+3}{x+2}$ $\textcircled{C} \frac{x+3}{2x-1}$ $\textcircled{C} \frac{2x+3}{2x-1}$ $\textcircled{C} \frac{x-3}{2x-1}$

4. Solve: $x^2 + 10x + 21 = 0$

$\textcircled{C} x = 7, x = 3$ $\textcircled{C} x = -7, x = 3$ $\textcircled{C} x = \frac{1}{7}, x = -3$ $\textcircled{C} x = -7, x = -3$

5. Solve: $x^2 - 3x - 10 = 0$

$\textcircled{C} x = 5, x = 2$ $\textcircled{C} x = 5, x = -2$ $\textcircled{C} x = -5, x = 2$ $\textcircled{C} x = -\frac{1}{5}, x = -2$

6. Solve: $x^2 - x - 6 = 0$

$\textcircled{C} x = \frac{1}{2}, x = 3$ $\textcircled{C} x = 2, x = -3$ $\textcircled{C} x = -2, x = 3$ $\textcircled{C} x = -2, x = -3$

7. Solve: $10x^2 - x - 21 = 0$

$\textcircled{C} x = -\frac{2}{3}, x = -\frac{7}{5}$ $\textcircled{C} x = \frac{3}{2}, x = \frac{7}{5}$ $\textcircled{C} x = \frac{3}{2}, x = -\frac{7}{5}$ $\textcircled{C} x = -\frac{3}{2}, x = \frac{7}{5}$

8. Solve: $25x^2 - 5x - 2 = 0$

$\textcircled{C} x = 5, x = \frac{2}{5}$ $\textcircled{C} x = -\frac{1}{5}, x = \frac{2}{5}$ $\textcircled{C} x = \frac{1}{5}, x = -\frac{2}{5}$ $\textcircled{C} x = -\frac{1}{5}, x = -\frac{2}{5}$

9. Solve: $14x^2 + 37x + 5 = 0$

$\textcircled{C} x = -\frac{1}{7}, x = \frac{5}{2}$ $\textcircled{C} x = 7, x = -\frac{5}{2}$ $\textcircled{C} x = \frac{1}{7}, x = \frac{5}{2}$ $\textcircled{C} x = -\frac{1}{7}, x = -\frac{5}{2}$

State Test Review: Q26,27,28

This is a review for Simplifying Square Roots and Solving a Linear Inequality.

- Simplify completely: $\sqrt{20z^7y^8}$
 $\textcircled{C} 4y^4z^3\sqrt{5z}$ $\textcircled{C} 2y^4\sqrt{5z^7}$ $\textcircled{C} 4y^4z^3\sqrt{5z^7}$ $\textcircled{C} 2y^4z^3\sqrt{5z}$
- Simplify completely: $3\sqrt{64w^7u^4}$
 $\textcircled{C} 192u^2w^3\sqrt{w}$ $\textcircled{C} 24u^2\sqrt{w^7}$ $\textcircled{C} 24u^2w^3\sqrt{w}$ $\textcircled{C} 192u^2w^3\sqrt{w^7}$
- Simplify completely: $\sqrt{32} + \sqrt{8}$
 $\textcircled{C} 6\sqrt{2}$ $\textcircled{C} 2\sqrt{10}$ $\textcircled{C} 18\sqrt{2}$ $\textcircled{C} 20\sqrt{2}$
- Simplify completely: $\sqrt{75} - \sqrt{3}$
 $\textcircled{C} 6\sqrt{3}$ $\textcircled{C} 4\sqrt{3}$ $\textcircled{C} 6\sqrt{2}$ $\textcircled{C} 24\sqrt{3}$
- Simplify: $\sqrt{3}(\sqrt{2} + 2\sqrt{5})$
 $\textcircled{C} \sqrt{6} + \sqrt{30}$ $\textcircled{C} 2 + \sqrt{21}$ $\textcircled{C} 2\sqrt{21}$ $\textcircled{C} \sqrt{6} + 2\sqrt{15}$
- Simplify: $\sqrt{2}(\sqrt{5} + 4\sqrt{7})$
 $\textcircled{C} 8\sqrt{6}$ $\textcircled{C} 4 + 2\sqrt{6}$ $\textcircled{C} \sqrt{10} + 4\sqrt{14}$ $\textcircled{C} \sqrt{10} + 2\sqrt{14}$
- Simplify: $\sqrt{5}(4\sqrt{15} - \sqrt{5})$
 $\textcircled{C} 8\sqrt{30}$ $\textcircled{C} 4 + 2\sqrt{30}$ $\textcircled{C} 20\sqrt{3} - 5$ $\textcircled{C} 5\sqrt{3} + 6\sqrt{5}$
- Solve the inequality: $7(3x + 9) < 17$
 $\textcircled{C} x < \frac{10}{21}$ $\textcircled{C} x > -\frac{46}{21}$ $\textcircled{C} x > \frac{10}{21}$ $\textcircled{C} x < -\frac{46}{21}$
- Solve the inequality: $18x + 14 < 50x + 9$
 $\textcircled{C} x > \frac{5}{32}$ $\textcircled{C} x < -\frac{5}{32}$ $\textcircled{C} x > -\frac{5}{32}$ $\textcircled{C} x < \frac{5}{32}$
- Solve the inequality: $23x + 1 < 32x + 7$
 $\textcircled{C} x > \frac{2}{3}$ $\textcircled{C} x < \frac{2}{3}$ $\textcircled{C} x > -\frac{2}{3}$ $\textcircled{C} x < -\frac{2}{3}$

Form A

State Test Review: Q29,30

This is a review for Graphing linear equations and finding x and y intercepts.

1. Find the x-intercept for: $-2x - 6y = 7$

$\curvearrowright (0, -\frac{7}{2})$ $\curvearrowright (0, -\frac{7}{6})$ $\curvearrowright (-\frac{7}{2}, -\frac{7}{6})$ $\curvearrowright (-\frac{7}{2}, 0)$

2. Find the y-intercept for: $6x - 4y = 9$

$\curvearrowright (\frac{3}{2}, 0)$ $\curvearrowright (0, -\frac{9}{4})$ $\curvearrowright (0, \frac{3}{2})$ $\curvearrowright (\frac{3}{2}, -\frac{9}{4})$

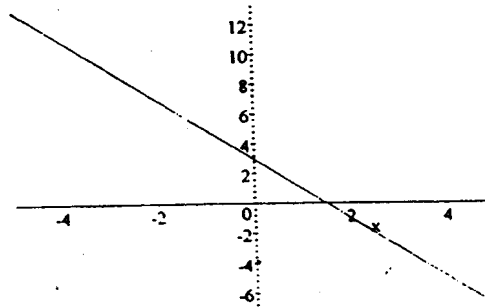
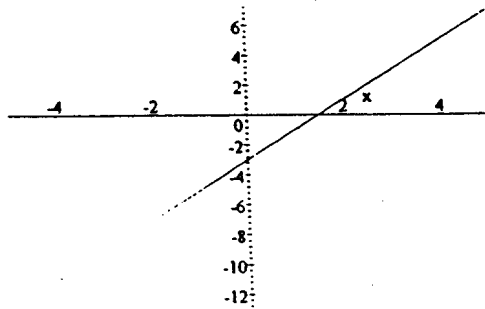
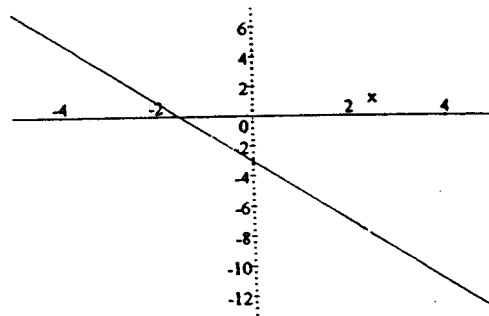
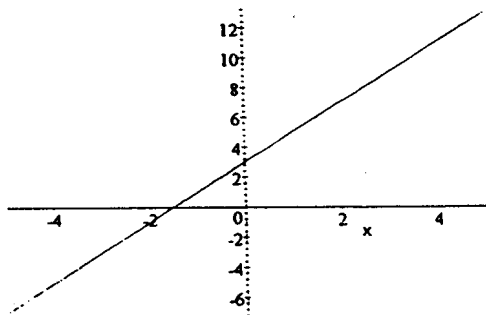
3. Find the x-intercept for: $-6x - 9y = -2$

$\curvearrowright (0, \frac{1}{3})$ $\curvearrowright (\frac{1}{3}, 0)$ $\curvearrowright (\frac{1}{3}, \frac{2}{9})$ $\curvearrowright (0, \frac{2}{9})$

4. Find the y-intercept for: $2x - 6y = -8$

$\curvearrowright (0, \frac{4}{3})$ $\curvearrowright (-4, 0)$ $\curvearrowright (-4, \frac{4}{3})$ $\curvearrowright (0, -4)$

5. Find the graph that best matches the given linear equation: $y = 2x - 3$



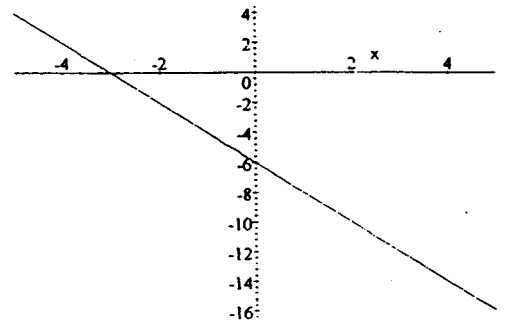
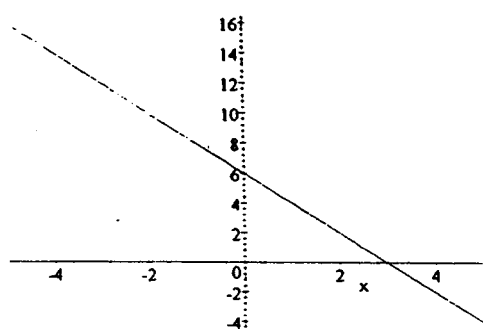
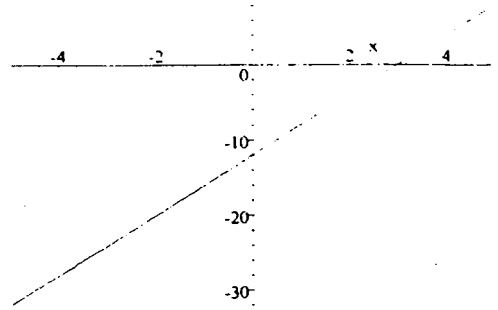
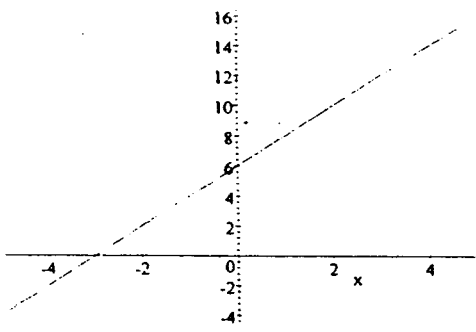
Q29,30

1. D
2. B
3. B
4. A
5. C
6. C
7. A

Form A

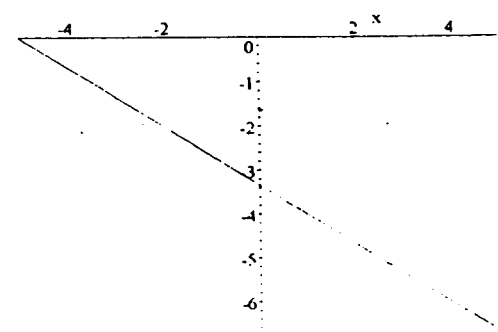
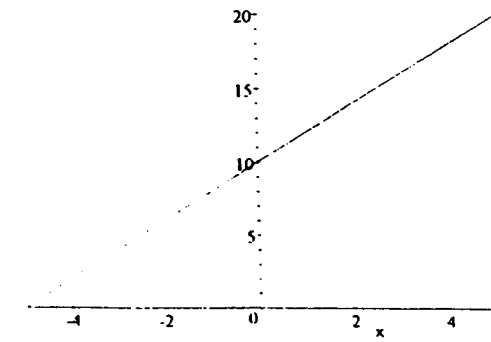
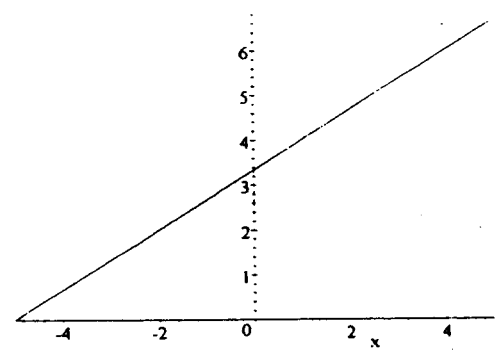
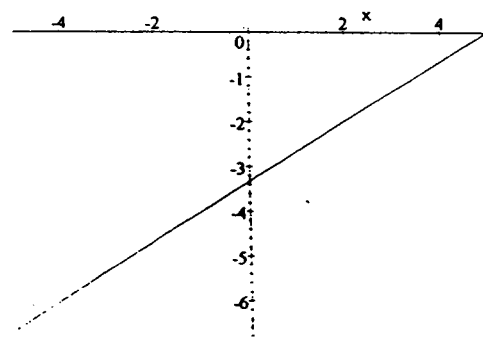
6. Find the graph that best matches the given linear equation:

$4x + 2y = 12$



7. Find the graph that best matches the given linear equation:

$2x - 3y = 10$



Form A

State Test Review Answers (By Number)

Form A

Q1,2,3,4

1. D
2. B
3. D
4. B
5. C
6. D
7. C
8. B
9. D
10. B
11. C
12. B

Q5,6,7,8

1. D
2. A
3. A
4. C
5. B
6. C
7. D
8. C
9. D
10. A
11. D
12. D
13. D

Q9,10,11

1. A
2. A
3. B
4. C
5. D
6. B
7. D
8. C
9. A

Q12,13,14

1. A
2. D
3. B
4. B
5. A
6. D
7. A
8. D
9. A

Q15,16,17,18

1. B
2. C
3. C
4. B
5. A
6. C
7. A
8. A
9. A
10. C
11. C
12. A
13. B

Q19,20,21,22

1. A
2. A
3. D
4. C
5. A
6. D
7. D
8. C
9. A
10. D

Q23,24,25

1. B
2. A
3. B
4. D
5. B
6. C
7. C
8. B
9. D

Q26,27,28

1. D
2. C
3. A
4. B
5. D
6. C
7. C
8. D
9. A
10. C

Q29,30

1. D
2. B
3. B
4. A
5. C
6. C
7. A