Algebra 1 Ch7 (7-4 to 7-6) Final Exam Review Spring 2015

1. Friday I walked 30 minutes and jogged 10 minutes and burned 330 calories. On Saturday I walked 25 minutes and jogged 40 minutes and burned 750 calories. Write and solve a system of equations to find out how many calories are burned per minute for both walking and jogging.

Graph each linear inequality on the x-y plane.

2. $y \leq -\frac{1}{5}x + 4$

3. $y > 3x$

4. $6x - 8y \geq 24$

5. $x > -3$

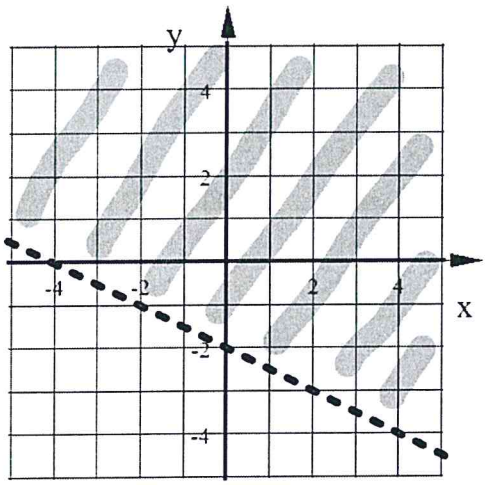
6. $y \leq 4$

Graph each system of inequalities. Use a colored pencil or highlighter to shade the solution region.

7. $y < -3x + 5$
   $y \leq 4x$

8. $x \leq 2$
   $2x + 4y > 12$

9. Write the inequality that was used to make the graph below.

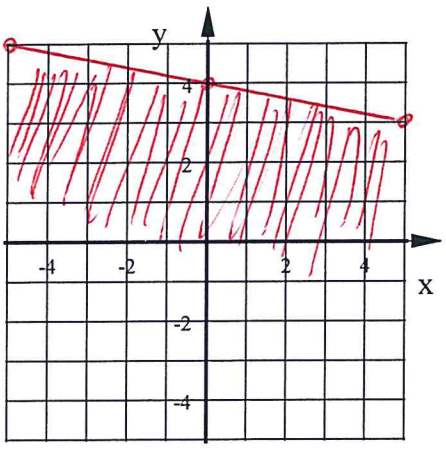


10. A plane makes a round-trip flight between two cities that are 945 miles apart. The plane takes 4.5 hours when flying into a headwind (against the wind) and takes 3.5 hours when flying into a tailwind (with the wind). Write and solve a system of equations to find the speed of the plane and the speed of the wind.

Algebra 1 Ch7 (7-4 to 7-6) Final Exam Review Spring 2015 ANSWERS

1. EQ: $30w + 10j = 330$ and $25w + 40j = 750$ $w = 6$ cal/min walking $j = 15$ cal/min jogging.

2.



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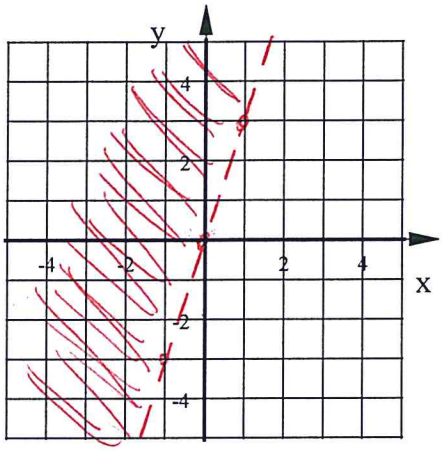

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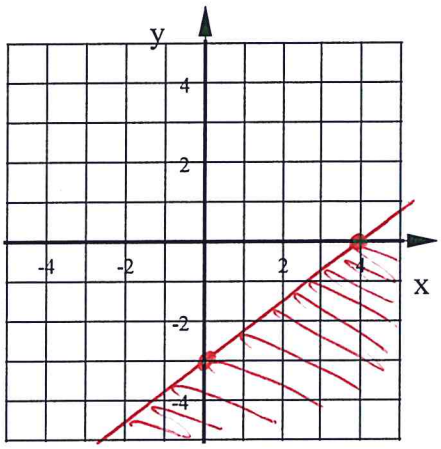

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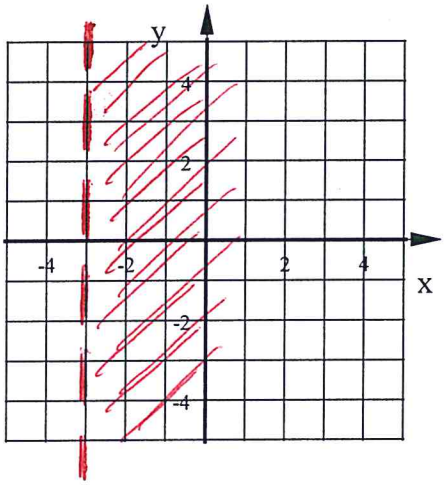

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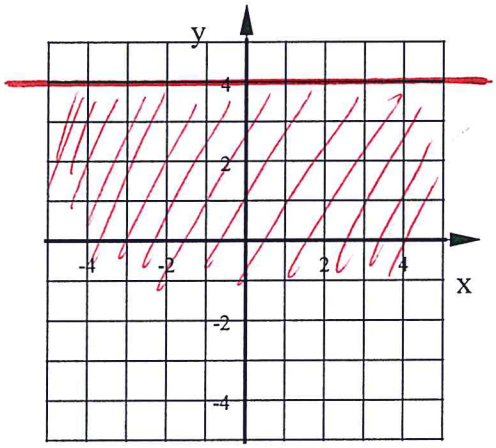

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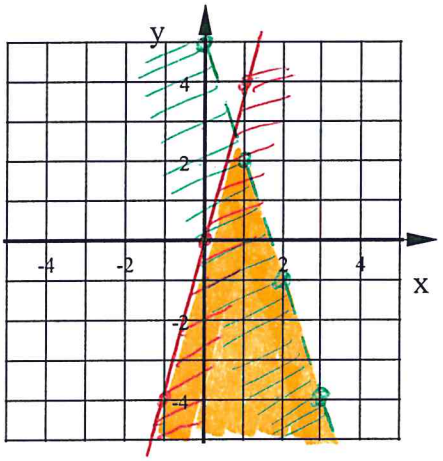

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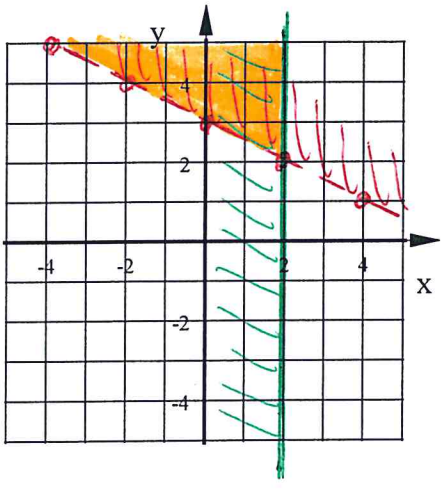


9. $y > -\frac{1}{2}x - 2$

10. EQ: $945 = (P - W)4.5$ and $945 = (P + W)3.5$
speed of the plane = 240 mph speed of the wind = 30 mph

Algebra 1 Chapter 8 Review Final Exam Spring 2015

Simplify each. Write without negative exponents. Do not use decimals, if needed leave coefficients as fractions in reduced form.

1. A^{-2} 2. $6M^{-4}$ 3. $-10R^5K^{-2}$ 4. $\frac{8X^4E^{-2}}{T^{-5}H}$ 5. $\frac{1}{G^{-3}}$

6. B^0 7. $15^0W^3J^{-4}$ 8. $12X^0$ 9. Y^5Y 10. $N^{-6}N^{10}N^0$

11. C^4C^{-6} 12. $(5A^4D^{-5})(3AD^{-6})$ 13. $(-R^{10}T^5V)(8R^{-4}T^2V^{-9})$

14. $(7^0C^8E^7Q)(E^9Q^4)$ 15. $(5M^3N^2P^4)(9MN^5P^{-2})(2M^{-4}N^2P^6)$

16. $(-3G^4H^9)(-6G^{-3}H^{-5})$ 17. $(T^3)^2$ 18. $(W^{-2})^{-3}$ 19. $(K^3)^{-6}$

20. $(Y^4)^0$ 21. $(10M^5R^3)^3$ 22. $(-5T^4W^{-3})^2$ 23. $(-4A^5B^4)^3$

24. $(4M^{-3}N)^2(10M^5N^4)$ 25. $(3T^8R^{-4})^{-2}$ 26. $(7J^{-2}H^3)^2(-H^3J^4)^5$

27. $(E^7F^4G)^3(E^3F^4G^5)^{-2}$ 28. $\frac{H^{12}}{H^7}$ 29. $\frac{12M^5}{4M^2}$ 30. $\frac{-15A^4C^5}{5A^{-2}C^2}$

31. $(\frac{144X^{25}Y^{-16}}{128X^{18}Y^{-14}})^0$ 32. $\left(\frac{8}{F^3}\right)^{-2}$ 33. $\left(\frac{G^5H^4J^3}{G^2H^3}\right)^2$ 34. $\left(\frac{5A^4B^2}{AB^5}\right)^{-2}$

35. $\frac{-24M^4X^9}{12MX^8}$

Evaluate for $A = 4$ $B = -2$ $C = 6$. Leave fractional answers in reduced form, NO DECIMALS.

36. $A^{-2}C^2$ 37. $\frac{8C}{B^{-3}}$ 38. $B^{-1}C^{-2}$ 39. $\frac{B^2}{5^{-1}C}$

Standard Form of an exponential equation: $y = ab^x$

40. State if each exponential equation represents growth or decay.

a) $y = 489(0.9975)^x$ b) $y = 1.36(1.0012)^x$ c) $y = 185(\frac{13}{14})^x$

41. Write the growth/decay factor (b) that each % change represents.

a) 23% increase b) 17.4% decrease c) 0.933% increase d) 1.04% decrease

42. For each growth/decay factor in the exponential equations below give the % change and state if it's an increase or decrease.

a) $y = 375(.982)^x$ b) $y = 2.58(1.954)^x$ c) $y = 6(1.085)^x$ d) $y = 2{,}750(0.37)^x$

43. You invested money in an account that increases 6.5% per year. The value of the account in 2008 was $52,400.

a) Find the value of the account in 2001.

b) Find the vlaue of the account in 2015.

44. The population of a city has been decreasing 5.2% each year. The population of the city was 130,000 in 1996.

a) Find the population in 2010.

b) Find the population in 1985.

Algebra 1 Final Exam Review Ch 9 Spring 2015

1. State the degree of each. a) $19m^7n^2$ b) $6t^2 + 7t^3 + 2t - 15 + 9t^4$

2. Expand each. a) $5r(2r^2 - 6r)$ b) $7kj^3(k^5 + 2k^2j^2 - 3kj^4)$

3. Factor each using GCF.
a) $12m^2 - 4m$ b) $18w^5 + 8w^3$ c) $24a^4b^3 - 20a^3b^5 + 12a^2b^7$

4. Expand each.
a) $(m + 7)(m - 3)$ b) $(a - 5)(a - 2)$ c) $(3r + 5)(2r - 1)$ d) $(w + 7)^2$

e) $(y + 8)(y - 8)$ f) $(3n + 2)(3n - 2)$ g) $(2k + 3)(k^2 + 5k - 7)$

5. Factor each completely. Always look for GCF first.
a) $12x^3 - 38x^2 + 30x$ b) $r^2 + r - 30$ c) $10y^2 + 7y - 12$ d) $x^2 - 2x - 63$

e) $c^2 + 16c + 64$ f) $8w^2 + 10w + 3$ g) $5p^2 - 40p + 60$ h) $3c^2 + c - 14$

i) $w^2 - 36$ j) $9w^2 - 100$ k) $4g^3 - 196g$

6. Name each polynomial by i) it's degree and ii) the # of terms.
a) $4x^3$ b) $7a^2 - 9a + 1$ c) $6Q + 9$ d) -4

Algebra 1 Final Exam Review Ch 9 Spring 2015 ANSWERS

1. a) Degree=9 b) Degree=4

2. a) $10r^3 - 30r^2$ b) $7k^6j^3 + 14k^3j^5 - 21k^2j^7$

3. a) $4m(3m - 1)$ b) $2w^3(9w^2 + 4)$ c) $4b^3a^2(6a^2 - 5ab^2 + 3b^4)$

4. a) $m^2 + 4m - 21$ b) $a^2 - 7a + 10$ c) $6r^2 + 7r - 5$
d) $w^2 + 14w + 49$ e) $y^2 - 64$ f) $9n^2 - 4$ g) $2k^3 + 13k^2 + k - 21$

5. a) $2x(2x - 3)(3x - 5)$ b) $(r + 6)(r - 5)$ c) $(2y + 3)(5y - 4)$ d) $(x + 7)(x - 9)$
e) $(c + 8)^2$ f) $(4w + 3)(2w + 1)$ g) $5(p - 2)(p - 6)$ h) $(3c + 7)(c - 2)$
i) $(w - 6)(w + 6)$ j) $(3w - 10)(3w + 10)$ k) $4g(g + 7)(g - 7)$

6. a) $4x^3$ i) Cubic ii) Monomial b) $7a^2 - 9a + 1$ i) Quadratic ii) Trinomial
c) $6Q + 9$ i) Linear ii) Binomial d) -4 i) Constant ii) Monomial

Algebra 1 Final Exam Review Ch 10 Spring 2015

1. Tell if each parabola opens up or down and then tell if the vertex is a maximum or a minimum.

a) $y = 0.35x^2 + x - 8$ b) $y = -7x^2 + 19$ c) $y = -x^2 + 9x + 15$

2. Put these parabolas in order from widest to narrowest

A $y = -9x^2 + 3x - 7$ B $y = -1.3x^2 - 4x + 8$ C $y = x^2 - 2x - 8$ D $y = 6x^2 + 13$

3. Find the equation for the Line of Symmetry and the coordinates of the vertex of each parabola.

a) $y = -6x^2 - 48x + 5$ b) $y = x^2 + 12x + 20$ c) $y = 8x^2 + 11$

4. Find the y-intercept for each parabola.

a) $y = -8x^2 + 6x - 5$ b) $y = 2x^2 + 15x$

5. Solve each quadratic equation using square roots. Leave non-integer answers in simplest radical form.

a) $45 - 5x^2 = 0$ b) $2x^2 - 11 = 89$ c) $3x^2 + 40 = 28$

6. This equation has already been factored for you. Find the solutions. $5x(3x - 7)(x + 4) = 0$

7. Solve each quadratic equation by factoring.

a) $3x^2 + 24x = 0$ b) $x^2 - 10 = 3x$ c) $4x^2 + 32x + 64 = 0$

d) $9x^2 - 100 = 0$ e) $6x^2 + 7x = 3$

8. Solve each quadratic equation using the quadratic formula. Round decimal answers to the nearest hundredth.

a) $3x^2 - 4x + 1 = 0$ b) $x^2 + 8x - 5 = 0$ c) $2x^2 - 3x + 7 = 0$

d) $49x^2 - 70x + 25 = 0$

9. A ball is shot upwards from the top of a 30 foot cliff with an initial velocity of 112ft/sec. The following equation gives the height of the ball as a function of time. $h = -16t^2 + 112t + 30$

a) Find the time it takes the ball to reach it's maximum height.

b) Find the maxmimum height of the ball.

c) Find the time it takes the ball to reach the ground.

d) Find the time it takes to reach a height of 90 feet.

10. Simplify each radical. a) $\sqrt{176}$ b) $\sqrt{294}$ c) $\sqrt{432}$

Algebra 1 Final Exam Review Ch 11 Spring 2015

Simplify each radical expression.

1. $\sqrt{126}$ 2. $\sqrt{a^{17}b^6}$ 3. $\sqrt{18c^7}$ 4. $\frac{\sqrt{10x^9}}{\sqrt{32x^3}}$ 5. $\sqrt{6g^3} \cdot \sqrt{15g^8}$

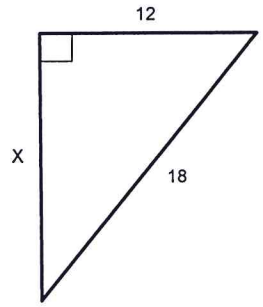
6. $8\sqrt{3} - 5\sqrt{2} + 7\sqrt{8} - \sqrt{27}$ 7. $2\sqrt{5}(4\sqrt{3} + 8\sqrt{5})$

8. $(7 - 2\sqrt{6})(3 + \sqrt{6})$ 9. $(4 - \sqrt{10})(4 + \sqrt{10})$

Rationalize the denominator. 10. $\frac{14a^4}{\sqrt{6a}}$ 11. $\frac{45}{\sqrt{5}}$

Find the length of the missing side using the Pythagorean Theorem. Round to the nearest hundredth where necessary.

12.



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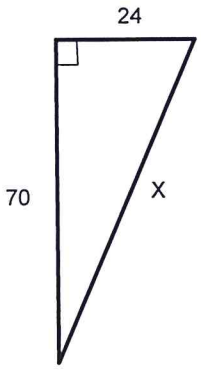


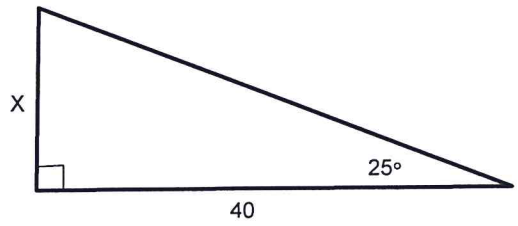
14. Do these three sides make a right triangle? $16, 63, 65$

15. Find the missing number in each Pythagorean Triple.

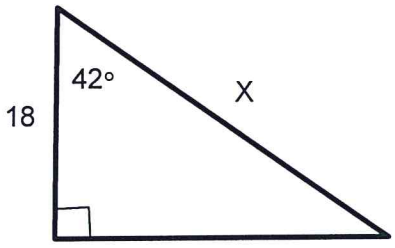
a) 18, 30, ____ b) 15, 112, ___

Find the missing side in each triangle using one of the trigonometric ratios. Round to the nearest hundredth.

16.



17.



18. Find the length of each segment. Round to the nearest tenth if needed.

a) Segment AB: $A(4,-9) \& B(6,13)$ b) Segment CD: $C(-8,7) \& D(3,7)$

19. Find the midpoint of each segment.

a) Segment EF: $E(21,-8) \& F(6,2)$ b) Segment QR: $Q(5,19) \& R(5,11)$

Algebra 1 Chapter 8 Review Final Exam Spring 2015 ANSWERS

1. $\frac{1}{A^2}$ 2. $\frac{6}{M^4}$ 3. $\frac{-10R^5}{K^2}$ 4. $\frac{8X^4T^5}{E^2H}$ 5. G^3 6. 1 7. $\frac{W^3}{J^4}$ 8. 12 9. Y^6

10. N^4 11. $\frac{1}{C^2}$ 12. $\frac{15A^5}{D^{11}}$ 13. $\frac{-8R^6T^7}{V^8}$ 14. $C^8E^{16}Q^5$ 15. $90N^9P^8$ 16. $18GH^4$

17. T^6 18. W^6 19. $\frac{1}{K^{18}}$ 20. 1 21. $100M^{15}R^9$ 22. $\frac{25T^8}{W^6}$ 23. $-64A^{15}B^{12}$

24. $\frac{160N^6}{M}$ 25. $\frac{R^8}{9T^{16}}$ 26. $-49H^{21}J^{16}$ 27. $\frac{E^{15}F^4}{G^7}$ 28. H^5 29. $3M^3$ 30. $-3A^6C^3$

31. 1 32. $\frac{F^6}{64}$ 33. $G^6H^2J^6$ 34. $\frac{B^6}{25A^6}$ 35. $-2M^3X$ 36. $\frac{9}{4}$ 37. -384 38. $-\frac{1}{72}$

39. $\frac{10}{3}$ 40. a) Decay b) Growth c) Decay

41. a) $b = 1.23$ b) $b = .826$ c) $b = 1.0093$ d) $b = .9896$

42. a) 1.8% decrease b) 95.4% increase c) 8.5% increase d) 63% decrease

43. a) $52400(1.065)^{-7} = \$33,719.73$ b) $52400(1.065)^{7} = \$81,428.90$

44. a) $130000(.948)^{14} = 61,555$ b) $130000(.948)^{-11} = 233,910$

Algebra 1 Final Exam Review Ch 10 ANSWERS Spring 2015

1. a) Opens up, Vertex is a Min b) Opens down, Vertex is a Max c) Opens down, Vertex is a Max

2. C, B, D, A

3. a) LOS: $x = -4$, Vertex $(-4, 101)$ b) LOS: $x = -6$, Vertex: $(-6, -16)$
c) LOS: $x = 0$, Vertex:$(0, 11)$

4. a) $y - int = -5$ b) $y - int = 0$ 5. a) $x = \pm 3$ b) $x = \pm 5\sqrt{2}$ c) No Real Solution

6. $x = -4, 0, \frac{7}{3}$

7. a) $x = -8, 0$ b) $x = -2, 5$ c) $x = -4$ d) $x = \pm\frac{10}{3}$ e) $x = -\frac{3}{2}, \frac{1}{3}$

8. a) $x = 0.33, 1$ b) $x = -8.58, 0.58$ c) No real solution d) $x = 0.71$

9. a) $t = 3.5$ sec b) Max height 226 ft c) $t = 7.26$ sec d) $t = 0.58$ and 6.42 sec

10. a)$4\sqrt{11}$ b) $7\sqrt{6}$ c) $12\sqrt{3}$

Algebra 1 Final Exam Review Chapter 11 Spring 2015 ANSWERS

1. $3\sqrt{14}$ 2. $a^8b^3\sqrt{a}$ 3. $3c^3\sqrt{2c}$ 4. $\frac{x^3\sqrt{5}}{4}$ 5. $3g^5\sqrt{10g}$

6. $9\sqrt{2} + 5\sqrt{3}$ 7. $8\sqrt{15} + 80$ 8. $\sqrt{6} + 9$ 9. 6 10. $\frac{7a^2\sqrt{6a}}{3}$

11. $9\sqrt{5}$ 12. 13.42 13. 74 14. Yes

15. a) 24 b) 113 16. $x = 18.65$ 17. $x = 24.22$

18. a) 22.1 b) 11 19. a) $(13.5, -3)$ b) $(5, 15)$