Final exam Review Math 20

A. Absolute Value

1. $|-23|$ 2. $3|-5|$ 3. $|10|-|-5|+|4|$

4. $3|-5|+2|4|-3|-2|$

B. Radical expressions

1. $\sqrt{450}$ 2. $\sqrt{\frac{16}{25}}$ 3. $5\sqrt{36}$

4. $-3\sqrt{75}$ 5. $\sqrt{x^2y^6}$ 6. $\sqrt{27x^3y^7}$

7. $4\sqrt{3}\bullet 2\sqrt{3}$ 8. $4\sqrt{15}\bullet 2\sqrt{6}$ 9. $3x\sqrt{xy^3}\bullet 4y\sqrt{xy^3}$

10. $2\sqrt{3}\left(1-4\sqrt{3}\right)$ 11. $\sqrt{2}\left(4-5\sqrt{3}\right)$ 12. $\left(3-2\sqrt{x}\right)^2$

13. $\left(2-5\sqrt{3}\right)\left(3+2\sqrt{15}\right)$ 14. $\frac{4}{2\sqrt{3}}$ 15. $\frac{\left(1+3\sqrt{2}\right)}{5\sqrt{3}}$

16. $3\sqrt{5}-2\sqrt{7}-4\sqrt{5}+6\sqrt{7}$ 17. $2\sqrt{18a^2bc}-3a\sqrt{2bc}$

18. $3\sqrt{8}+5\sqrt{2}-4\sqrt{3}+\sqrt{18}$ 19. $\sqrt{240}-2\sqrt{54}+\sqrt{540}+3\sqrt{24}$

20. If the area of a given rectangle is $\sqrt{42}$ and the width is $\sqrt{6}$. Find the length.

21. if a given triangle has a base of $\sqrt{5}$ and an area of 8, find its height.

C. Exponents

1. 7^0 2. $\left(3x+1\right)^0$ 3. $\left(\frac{1}{2}\right)^{-3}$

4. $\left(3^{-5}\right)\left(3^4\right)$ 5. $x^2\bullet x^3$ 6. $3x^2y^3\bullet 2x^3y^4$

7. $\left(4x^2y^3\right)^2$ 8. $\left(3x^3y\right)^3\left(27xy^2\right)^2$ 9. $\left(3^0x^2y^3\right)^5$

8. $\dfrac{6x^2y^5}{18x^5y^2}$ 11. $\dfrac{5x^2y}{4a^5b^3} \bullet \dfrac{16(ab^3)^2}{(25x^2y^4)^3}$ 12. $\dfrac{x^4y}{5x^3y^{-2}} \div \dfrac{(x^3y)^2}{15x^5y^3}$

D. Factoring:

1. $-13x^2 - 26x + 52$
2. $12x^3y - 8x^2y^2 + 10xy^3$
3. $wx^2 - bx + wc^2 - bc^2$
4. 12wy - 9xy + 32wz - 12xz
5. $x^2 - 144$
6. $9a^2b^2 - 16$
7. $a^2 - (b-c)^2$
8. $x^2 + 7x + 12$
9. $x^2 - 13x + 42$
10. $x^2 + 5x - 36$
11. $x^2 - 4x - 165$
12. $4x^2 - 88x + 484$
13. $5x^2 - 13x - 6$
14. $2y^2 + 10y - 48$
15. $10x^2 - 29x + 10$
16. $24x^2 + 41x + 12$

F. Polynomials: Simplify each of the following:

1. $\dfrac{2x^2 + 4x - 30}{x + 5}$
2. $\dfrac{16x^2 - 25}{4x - 5}$
3. $\dfrac{18x^2 - 3x - 10}{3x + 2}$
4. $\dfrac{2a + 4}{a} \bullet \dfrac{a^2 + 8a}{2}$
5. $\dfrac{2m^2 + m - 3}{m^2 - 3m + 2} \bullet \dfrac{m^2 - 2m}{2mn + 3n}$
6. $\dfrac{2x^2 + 7x + 3}{10x^2 + 2x} \bullet \dfrac{8x}{3x + 9} \bullet \dfrac{10x^2 - 13x - 3}{2x + 1}$
7. $\dfrac{k^2 - m^2}{k^2 - km} \div \dfrac{k^2 + km}{km + m^2}$
8. $\dfrac{k^2 + 3k - 10}{k^2 + 2k - 15} \div \dfrac{k^2 - 4k + 4}{3k - 6}$
9. $\dfrac{7x - 3}{8x} - \dfrac{7x + 1}{8x}$
10. $\dfrac{3w}{4} + \dfrac{w}{5} - \dfrac{w}{8}$
11. $\dfrac{3w + 1}{3} + \dfrac{w - 8}{4}$
12. $\dfrac{4}{r^3s} - \dfrac{3}{r^2s^2} + \dfrac{2}{rs^3}$

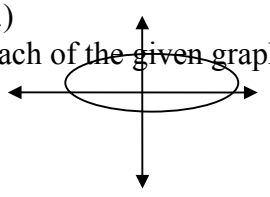
G. Long Division:

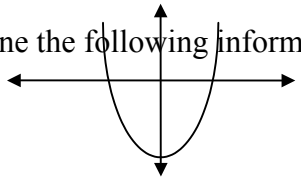
1. $\dfrac{3x^2 + 10x + 8}{x + 2}$
2. $(x^4 + 3 - 5x^2) \div (x - 1)$

H. Quadratic Functions:

a) Determine whether each of the following is a function or a relation:
1) {(3, 4), (-2, 6) (3, 6)} 2. {(-4, 3), (-7, 3), (-11, 3)}
3.) 4)

b) For each of the given graphs determine the following information:





1. the value of a
2. the value of p
3. the value of q
4. is the curve wider, narrower or the same as $y = x^2$
5. the direction of opening
6. the coordinates of the vertex
7. the equation of the axis of symmetry
8. domain of the function
9. range of the function
10. does the graph have a maximum or minimum value
11. what is the maximum or minimum value
12. sketch the curve

Given graphs:

a) $y = 2x^2$ b) $y = -3x^2 + 5$ c) $y = 2 / 3x^2 - 1$

b) $y = \left(x - 1^2\right)$ e) $y = -2\left(x + 3\ \right)^2 - 4$

c) A sky diver jumps from a plane. His path from the plane to the ground can be defined by the equation $h = -4.9t^2 + 3000$ where "h" represents height and "t" represents time:
   1) Graph the function using a graphing calculator (x for t and y for h)
   2) How long does it take for the shy diver to land?
   3) How high is the plane?
   4) The parachute automatically opens at an altitude of 400m. How long has the sky diver been in the air when the parachute opened?

I. Solving Equations: (Use the indicated method)

a) Factoring
   1) (x + 3)(x - 2) = 0 2) $x^2 + x = 6$
   2) $-5x^2 + 4x = -12$ 4) $5x^2 + 3x = 4x - 3x^2 + 7$

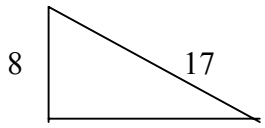
b) Square root method
   1) $3b^2 = 75$ 2) $64x^2 - 81 = 0$
   2) $(r - 15)^2 = 100$ 4) $-6\left(y - 4\right)^2 = 24$

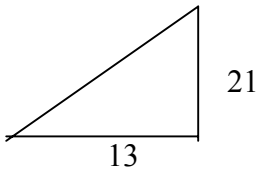
c) Squaring both sides
   1) $\sqrt{x} = 6$ 2) $\sqrt{3x + 4} = 5$
   3) $\sqrt{x - 15} + 8 = 12$ 4) $\sqrt{x^2 + 5} - 4 = 3$

I. Right Triangles

a) Do the following measures represent a right triangle: 25, 37, 44

b) Find the missing measures:

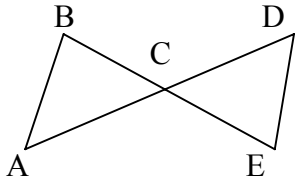




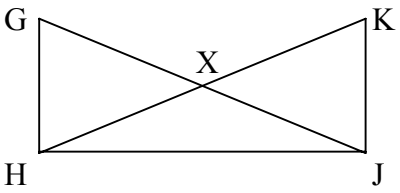
c) How far apart are two joggers if one has run 8 kms north and the other has run 14 kms east?

J. Proving Triangles Congruent

a) Given: BE bisects AD, AD bisects BE
Prove: AB = ED

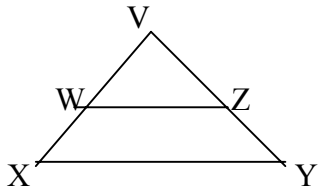


b) Given: $GH \perp HJ, KJ \perp HJ, \angle G = \angle K$
Prove: GH = KH



K. Similar Triangles

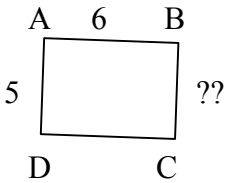
a) Given: WZ // XY
Prove : $\Delta VWZ \approx \Delta VXY$

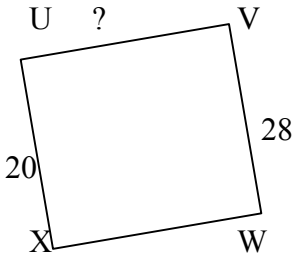


b) If the scale factor of ΔAVB to ΔNVK is 5/8. If VA = 2.5 and VB = 1.7, then VN =

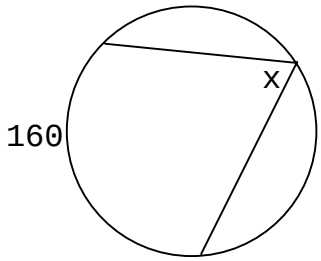
c) If 8/9 = x/15, then x =

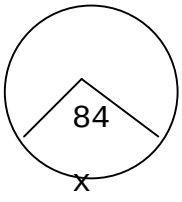
d) If quad ABCD is similar to quad UVWX, find the indicated parts:

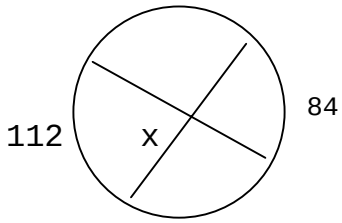


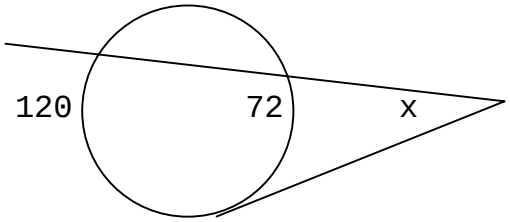


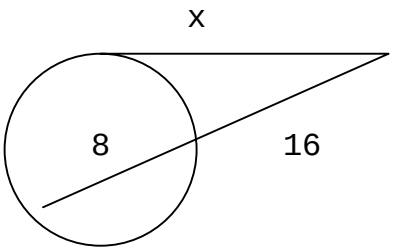
L. Angles, arcs, chords tangents secants

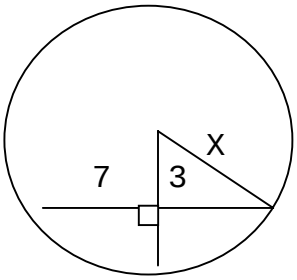

160
x

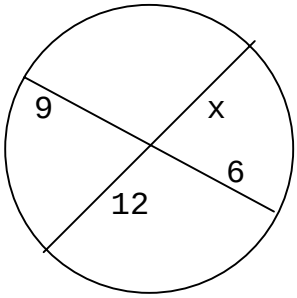

84
x


112
x
84


120
72
x


x
8
16


X
7
3


9
x
6
12