Grade 11 Math
Review of Necessary Skills
"This is what you need to know."

Working with Exponents

1. Simplify using the exponents laws.

a) $(b^5)(b^6)(b)$ b) $(t^4)\div(t^{-2})$ c) $(x^3)^5$ d) $\left(\frac{m^3}{n^5}\right)^2$ e) $\frac{(3n^4)(6n^2)}{(6n^3)^2}$

f) $\frac{(4x^4y^6)(9xy^{-3})}{6x^{-2}y^9}$ g) $(3x^2)^3$ h) $(5ab^3)^3$ i) $\left(\frac{8a^4}{2a}\right)^4$

Solving Linear Equations

2. Solve. Check only those that have an asterisk (*).

a) *5(x - 3) - 2x = -6* b) *2(2r - 1) + 4 = 5(r + 1)* c) *4(y - 2) = 3(y + 1) + 1 - 3y*

d) $\frac{x}{3}+\frac{1}{2}=0$ e) $\frac{x}{3}-\frac{1}{2}=\frac{1}{4}$ f) $\frac{2x+1}{3}-\frac{x+1}{4}=3$

Simplifying Expressions

3. Expand and simplify.

a) *3(4t - 8) + 6(2t - 1)* b) $4(3x^2-2x+5)-6(x^2-2x-1)$ c) $(2x-3)(5x+2)$

d) $-3(4t-1)^2$ e) $(3x+1)(x+7)+(x-4)(4x+3)$ f) $(2x-1)^2-(3x+1)(3x-1)$

Factoring

4. Factor fully.

a) $4m^2-28m$ b) $3ab-9ab^2+6a^2b$ c) $a^2+4a-21$ d) $x^2-9xy+14y^2$

e) $3x^2-3x-6$ f) $3t^2+8t+5$ g) $4y^2+4y-3$ h) $4x^2-8xy-5y^2$

i) x^2-36 j) $36t^2-49$ k) $121a^2-b^2$ l) $9t-4t^3$

Quadratic Functions

5. Write each function in the form $y=a(x-h)^2+k$ by completing the square. State the maximum or minimum value and where it occurs.

a) $y=x^2+4x+1$ b) $y=x^2-10x+15$

c) $y=3x^2-12x+7$ d) $y=-3x^2+18x-22$

6. Sketch each of the parabolas from question #5 using transformations.

Quadratic Equations

7. Solve the following. Express answers as exact roots and approximate roots, to the nearest hundredth where necessary.

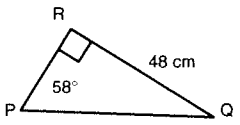
a) $x^2+3x-28=0$ b) $x^2+5x-3=0$ c) $8w^2=2-3w$

d) $\frac{x^2}{6}-x+\frac{4}{3}=0$ e) $8k^2-3k=0$ f) $3=5x+3x^2$

Trigonometry

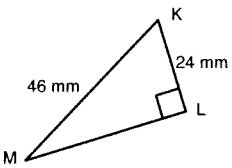
8. Solve each triangle. Round side lengths to nearest tenth and angles to nearest degree.

a)



b) In ΔRST, $\angle R = 90°$, $\angle S = 55°$ and $s = 17$ km.

c)



Grade 11 Math
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Solutions

1a) b^{12} b) t^6 c) x^{15} d) $\frac{m^6}{n^{10}}$ e) $\frac{1}{2}$ f) $6x^7y^{-6}$ g $27x^6$ h) $125a^3b^9$ i) $256a^{12}$

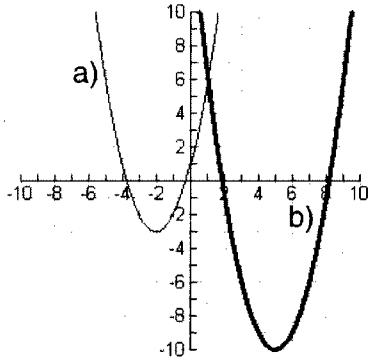
2a) x = 3 b) r = -3 c) y = 3 d) $x = -\frac{3}{2}$ e) $x = \frac{9}{4}$ f) x = 7

3a) 24t - 30 b) $6x^2 + 4x + 26$ c) $10x^2 - 11x - 6$
d) $-48t^2 + 24t - 3$ e) $7x^2 + 9x - 5$ f) $-5x^2 - 4x + 2$

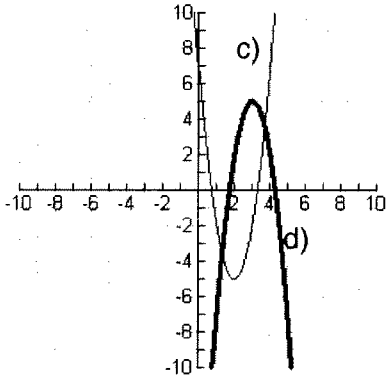
4a) 4m(m - 7) b) 3ab(1 - 3b + 2a) c) (a + 7)(a - 3) d) (x - 7y)(x - 2y)
e) 3(x - 2)(x + 1) f) (3t + 5)(t + 1) g) (2y + 3)(2y -1) h) (2x - 5y)(2x + y)
i) (x + 6)(x - 6) j) (6t - 7)(6t + 7) k) (11a - b)(11a + b) l) t(3 - 2t)(3 + 2t)

5a) $y = (x + 2)^2 - 3$ b) $y = (x - 5)^2 - 10$ c) $y = 3(x - 2)^2 - 5$ d) $y = -3(x - 3)^2 + 5$
Minimum value of -3 when x = -2
Minimum value of -10 when x = 5
Minimum value of -5 when x = 2
Maximum value of 5 when x = 3

6a) and b)



c) and d)



7a) x = -7 and x = 4

b) $x = \frac{-5 \pm \sqrt{37}}{2}$
x ≈ 0.54 and x ≈ -5.54

c) $w = \frac{-3 \pm 8\sqrt{2}}{16}$
w ≈ 0.52 and w ≈ -0.89

d) x = 2 and x = 4

e) k = 0 and k = $\frac{3}{8}$

f) $x = \frac{-5 \pm \sqrt{61}}{6}$
x ≈ 0.47 and x ≈ -2.13

8a) ∠Q = 32°; PR = 30 cm; PQ = 56.6 cm

b) ∠T = 35°; RS = 11.9 km; ST = 20.7 km

c) LM = 39.2 mm; ∠M = 31°; ∠K=59°

DO NOT WRITE ON THIS QUESTION SHEET.

Grade 11 Math
Diagnostic Test

Shade in your chioce on the answer sheet to each of the questions below.

1. Simplify: $(5m^3)(4m^2)$

a) $20m^6$ b) $20m$ c) $20m^5$ d) $9m^5$

2. Simplify: $\frac{36a^8b^4}{18a^2b}$

a) $2a^4b^3$ b) $2a^6b^3$ c) $2a^4b^4$ d) $2a^6b^4$

3. Simplify: $(-4x^2)^3$

a) $-64x^5$ b) $-64x^6$ c) $-12x^6$ d) $64x^6$

4. Simplify: $\frac{(3m^2n^4)(4m^3n)}{24mn^5}$

a) $\frac{m^4}{2}$ b) $2m^4$ c) $\frac{m^4n}{2}$ d) $2m^4n$

5. Solve: $12(2m - 3) = 2(m + 4)$

a) $m = -1$ b) $m = 1$ c) $m = -2$ d) $m = 2$

6. Solve: $\frac{7x}{6} - 2 = \frac{1}{3}$

a) $x = \frac{4}{7}$ b) $x = \frac{3}{7}$ c) $x = -2$ d) $x = 2$

7. Simplify: $(3x + 1)(x + 7) - 4(x^2 - 6x - 4)$

a) $-x^2 + 46x + 23$ b) $-x^2 - 2x - 9$ c) $-x^2 + 24x + 23$ d) $-x^2 - 2x - 9$

8. Simplify: $(4x - 5)^2 + (4x - 5)(4x + 5)$

a) $16x^2$ b) $20x^2 - 50$ c) $32x^2 - 40x$ d) $20x^2$

9. Factor fully: $42m^5n^3 - 18m^3n^5$

a) $3m^3n^3(14m^2 - 6n^2)$
b) $6mn(7m^4n^2 - 3m^2n^4)$
c) $6m^3n^3(7m^2 - 3n^2)$
d) $2m^3n^3(21m^2 - 9n^2)$

10. Factor fully: $b^2 - 4b - 32$

a) $(b + 8)(b - 4)$ b) $(b - 8)(b + 4)$ c) $(b - 8)(b - 4)$ d) $(b - 4)(b + 8)$

DO NOT WRITE ON THIS QUESTION SHEET.

11. Factor fully: $2t^2 + t - 6$

a) $(2t - 3)(t + 2)$ b) $(2t + 3)(t - 2)$ c) $(2t - 1)(t + 6)$ d) $(2t - 3)(2t + 2)$

12. Factor fully: $64a^2 - 1$

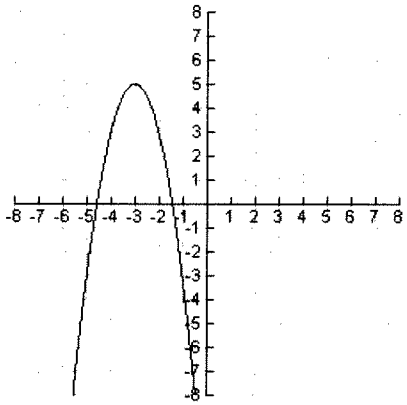
a) $(8a - 1)(8a - 1)$ b) $(8a - 1)(8a + 1)$ c) $(1 - 8a)(1 + 8a)$ d) $64(a - 1)(a + 1)$

13. Find the maximum or minimum value of $y = -5x^2 + 20x + 2$.

a) Maximum value of 2
b) Minimum value of 22
c) Maximum value of -2
d) Maximum value of 22

14. What is the equation of the parabola graphed below right?

a) $y = (x - 3)^2 + 5$
b) $y = -(x + 3)^2 + 5$
c) $y = 2(x + 3)^2 + 5$
d) $y = -2(x + 3)^2 + 5$



15. Solve: $t^2 + 6 = 5t$

a) $t = 3;\ t = 2$ b) $t = -3;\ t = -2$ c) $t = 6;\ t = 1$ d) $t = -3;\ t = 2$

16. Solve: $9t - 4t^3 = 0$

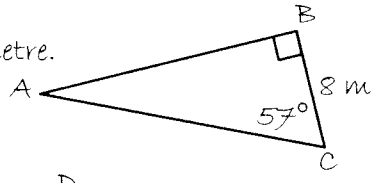
a) $t = \frac{3}{2}; t = -\frac{3}{2}$
b) $t = \frac{2}{3}; t = -\frac{2}{3}$
c) $t = 0; t = \frac{3}{2}; t = -\frac{3}{2}$
d) $t = 0; t = \frac{2}{3}; t = -\frac{2}{3}$

17. Solve: $3x^2 + 3 = -10x$

a) $x = -\frac{1}{3}; x = -3$ b) $x = -1; x = -3$ c) $x = \frac{1}{3}; x = 3$ d) $x = 1; x = 3$

18. Given ΔABC at right, find b to the nearest tenth of a metre.

a) 14.7 m b) 9.5 m c) 4.3 m d) 6.7 m



19. Given ΔDEF at right, find $\angle D$ to the nearest degree.

a) 52° b) 51° c) 38° d) 37°